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COMPUTERWORLD

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NEWS IN BRIEF

Systems Analysts' Job Picture Bright

WASHINGTON, D.C. – Federal labor officials have projected an excellent job market picture for systems analysts in the 1970s.

According to statistics from the Labor Department's Bureau of Labor Statistics, there will be an average of 22,700 openings for systems analysts per year to 1980; as of 1970 there were an estimated 100,000 people employed as systems analysts.

The excellent opportunities are due to rapid expansion of DP systems in business and government, according to the bureau projections.

These figures are part of a study on the job outlook for college graduates in the 1970s. Labor officials said the market for college graduates is likely to be tighter than in past decades, but those whose studies have been most relevant to the needs and requirements of the labor market should find "less difficulty in job adjustment" in the years immediately after graduation.

Painters' Strike Causes DP Center Shutdown

EDWARDSVILLE, Ill. – A recent strike by university workers at Southern Illinois University here became a "hot" issue for the university computer center. Operating engineers for the university's air-conditioning system refused to cross a painters' union picket line and with temperatures in the 90s the computer center was forced to close down for almost one week.

Many daily reports were late including registrar lists of class rolls – "teachers did not know who was in their classes," said Deborah Brown, supervisor of production control.

The major concern of the DP department was getting the payroll out in time. They were able to send the payroll to the university campus in Carbondale, however, with no delay in checks being issued.

On the Inside This Week

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Europe Gets IBM Data Entry Unit

By Michael Weinstein
Of the CW Staff

PARIS, France – IBM has introduced a new data entry system for its European users which is not available in the U.S.

IBM refused to comment on when the system would be available in the U.S. to provide improved data entry for its many keypunch users.

The 3740 system utilizes a new IBM "diskette" that is similar to a floppy disk as the data entry media. Data is entered onto these small self-contained disks from either a single keyboard 3741 or double keyboard 3742 Data Entry Station. As each record is entered onto the minidisk, the information is displayed on a CRT for visual confirmation.

The data stations can be used to edit data where the CRT will display data searched by record, searched by end-of-file and with an option data searched by character string.

Included in the 3740 system are a 3747 diskette-to-tape converter and a 3713 line printer.

These units work together to form an entire data entry system with data entered and edited at the stations. Minidisks are then transferred to other input stations or used in a converter to produce a magnetic tape for direct computer input or used by a line printer as an output device.

Minidisks can contain 1,898 records of either 80 or 128 character length. IBM said this is approximately the same amount of information contained on 3,000 punched cards. This capacity corresponds to the amount of information a keypunch operator in the U.S. could enter in two days.

Diskettes are self-contained, weigh 1.5 oz, and can be sent by mail to facilitate decentralized operations.

Line Printer

The 3713, a 40 char./sec printer, handles lines up to 128 characters. It can be directly connected to any data station for selective search of data in

(Continued on Page 2)

Users Get Idea: Better to Revise System Design

By Don Leavitt
Of the CW Staff

BOSTON – Users are beginning to see that it may be better to revise their system design for an application so they can use an existing software package, than to modify a package to meet their application plan, according to a software expert.

Speaking at last week's meeting of the Honeywell User Group (HUG), Larry Welke, president of International Computer Programs Inc. and publisher of ICP Quarterly, noted there are literally thousands of packages available. It is no more radical to alter a planned DP run in the light of products available for that kind of work than it is to alter a factory run to utilize a better screw machine or high-speed lathe, he added.

The horror stories about commercially available software have generally sprung from attempts by users, or even some vendors, to modify a very carefully constructed program to do something alien to its original design, he said.

Nothing really is free, Welke reminded his audience, most of whom still get "bundled" software from their vendor. Software is indeed a product, and a product in which development costs are spread across many users has to be cheaper than a do-it-yourself project, he said in urging the users to at least consider packages that can be purchased as well as those from Honeywell.

There are some 50,000 DP installations in the U.S., and there are an average of six programmers at each one, and each programmer produces four good programs a year, he said. That means there are more than a million programs being written each year, according to Welke.

There are applications really unique to an installation, but "you can't tell me there are 49,900 different ways of doing payroll, or payables, or receivables," he said.

Define System

By all means, define the application system and document how it should work, he urged the HUG membership. These steps are needed whether the pro-

(Continued on Page 2)

Frank T. Cary

T. Vincent Learson

CW Photos

Changing of the Guard

The Learson regime at IBM is about to end. Effective the first of the year, Frank T. Cary, IBM president since 1971, will take the reins from T. Vincent Learson, board chairman and chief executive officer, who is retiring at the age of 60. As of Jan. 1, 1973, all IBM corporate officers must retire at that age. Story on Page 21.

Interstate Index

Crime Net to Track 'Mob'

By Edward J. Bride
Of the CW Staff

SACRAMENTO, Calif. – A nationwide intelligence network designed to track organized crime figures has been in operation for almost a year, and evaluation of the computer system is now under way.

During this test phase, 16 terminals were located in agencies from Florida to California to New Jersey, all communicating with a Burroughs B5500 at the Michigan State Police headquarters in East Lansing.

The Interstate Organized Crime Index (IOCI) tracks some 3,000 figures believed to be involved in organized crime. It stores their name and physical location only, and not sensitive or arrest-type information, which is normally kept in manual files, according to project officials.

Arrest data or other intelligence information is only available through personal contact with agencies keeping these manual files, according to Charles Casey, chairman of the committee evaluating the year-long project.

Casey, assistant director of the California Department of Justice, said only "public record information" is entered into the manual or computerized portions of the system – even though the computerized portion contains only name and location.

The project will have cost some $500,000 by the time the evaluation is completed around the end of the year, Casey said. The money was given by the Law Enforcement Assistance Administration (LEAA) to a police association known as the Law Enforcement Intelligence Units (LEIU).

CRT and Hard Copy

Under the current phase, the system provides both CRT and hard-copy data on subjects, so intelligence officers in one section of the country can keep tabs on mobile organized crime figures, Casey related.

Terminal users are selected only after security screening, he continued, adding these users are held totally responsible for security and privacy once they have been cleared.

The precautions for this security and privacy are "more restrictive" than the FBI's criteria for protecting data, he added.

(Continued on Page 2)

Organized Crime Index Tested

(Continued from Page 1)

Questioned about the existence of "known-criminal data banks" in Iowa and possible other locations [CW, Sept. 20], Casey stressed the IOCI system only indexes the location of people.

It is not certain whether IOCI will become an ongoing system, he added. When the evaluation is complete, conclusions will be reached on whether it would be "valuable, or just another toy" for law enforcement, he said.

"It must be productive to be of use," he noted.

Talk to Each Other

Each terminal can contact the Michigan computer or any other terminal, according to Don Carroll, chairman of LEIU and a senior investigator for the district attorney in Orange County, Calif.

There are over 200 agencies represented in the intelligence association, and if the system becomes permanent, each would have access to the index in Michigan.

Avoiding use of the term "data bank," LEIU officials noted the grant was contingent on the collection and indexing only of public record information.

System planners have defined "public record" information as anything "normally available to the public, including newspapers" and completed trial records.

Some of the security precautions planned include the usual code to initiate contact with the computer, as well as individualized questions to identify terminal users.

Even if a user manages to bypass the "combination-lock" codes within the terminals, the random, individualized questions asked of him would prevent further progress toward the index, Carroll said.

For example, personal data such as dates, names of schools or even type of hair tonic used might assure that the user is the intended, authorized user, he explained.

The $500,000 already granted by LEAA amounts to a preliminary grant, and up to $1.6 million could be spent by the time the test phase is finally completed.

A team of federal observers from LEAA is monitoring the test, Carroll noted.

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A Dark Horse Almost Won

By Michael Merritt
Special to Computerworld

SNOHOMISH COUNTY, Wash. – @#$%&* almost won a legislative race in this county's first punched card ballot election Sept. 19. Candidates anxious to find the outcome of their elections instead found a print routine error in the computer program.

The error was a small one, according to Bob Noel, director of data processing for the county. The garbled results were first released shortly after 8 p.m. and the program was fixed and rerun by 12:40 the following morning. The official results – not counting absentee ballots – were available by 2:50 a.m.

Noel said the goof should have been caught in a printout proofreading procedure attended by county officials, party officials and private citizens. The error appeared in the last race on a long ballot, though, and the proofreaders' stamina apparently wasn't up to their task.

The validity of the election was not jeopardized by the mistake. After a fix and recompilation on the program recertification showed the ballots had been counted correctly, and totals assigned to the proper candidate. The mistake was at most "a major embarrassment," according to Don Whiting, assistant superintendent of elections for the state.

Europe Gets IBM Data Entry Unit

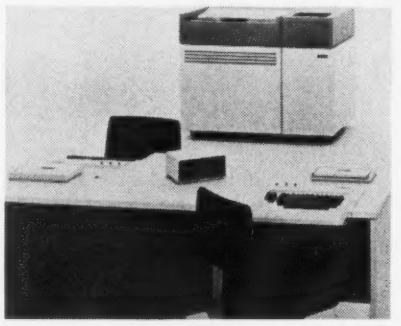
(Continued from Page 1)

the same manner as the CRT.

The 3747 converter permits the transfer of data from minidisks to standard magnetic tape – and from tape to minidisk – for direct entry to an outside computer.

In case of error the converter emits an audible signal and flashes an error display onto the data station CRT. The 3741 can also be equipped with a Binary Synchronous Communications Adapter (BSCA) to permit direct communication to a computer via data lines.

A small configuration of a data station, a printer and a converter will lease for about $950/mo on a two-year lease. The system will be available to European users in the third quarter of 1973.



The IBM system includes a 3742 double operator keystation.

Simple Method

Fetal Heart Monitored Closely

BOSTON – A computer monitor to enable doctors to find and treat the over 6% of prenatal infants that die or suffer brain damage from oxygen deficiency has been developed at the Boston Hospital for Women.

This device, developed in conjunction with the Brattle Instrument Corp., can measure the heartbeat of unborn children by detecting minute electrical signals carried to the surface of the expectant mother's skin.

The monitor unscrambles these signals into their component parts, one of which represents the infant's heartbeat. Other circuits amplify this signal so it can be printed out in the form of an electrocardiogram (EKG).

As a precaution, the machine automatically stops the printout when the signal cannot be sorted with complete reliability, restarting the EKG when the signals are again valid.

Before the development of this monitor, taking a fetal EKG required either invasion of the uterus and physically attaching an electrode to the fetus's scalp, or use of an ultrasonic device to measure fetal heart movement through the mother's abdomen.

These methods are not extensively used as they are either unpopular with the expectant mother or require highly skilled personnel to

The new Brattle monitor has none of these drawbacks.

Better to Revise System Design

(Continued from Page 1)

gramming is to be generated in-house or acquired through a package. Unless the user knows what he wants to do, he cannot measure how well equipped his staff or a package is to handle the job.

By going the package route, the user achieves possible immediate installation, including the training of user personnel and documentation that is probably better than the user would develop for himself, since it must satisfy all the vendor's customers.

There are no hidden costs for the user who acquires a true package, Welke said. The good vendors no longer go in for "flinch pricing" in which the cost is given verbally after a sales presentation.

Maintenance and updating for the first year is usually included in the basic price, and the cost of continuing support is also stated by the reputable software houses, he added.

They are in business, they have to have products they can sell and that are easy to support. This means, generally, software packages are better as well as cheaper than those the user can build for himself, Welke said.

Users are beginning to get the idea, he noted. This year the 800 firms really active in the software market will have sales of some $200 million.

Last year sales were $110 million and in 1970 they amounted to about $45 million, according to Welke's estimates, which he admitted differ radically from those of market research firms such as International Data Corp.

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Soviet Program Sharing Common

By E. Drake Lundell Jr.
Of the CW Staff

SAN FRANCISCO – A glimpse at how computer users in the Soviet Union cooperate in software development and other areas was provided here recently by Dr. Oleg Semenkov, director of the institute for engineering cybernetics in Minsk.

Semenkov said any software developed by any user was made available to all other users just for the cost of duplicating the tapes or cards, thus reducing duplication of efforts in software development.

The situation contrasts with that in the U.S. where user program swapping is the exception rather than the rule and where most software is developed on a commercial basis either by the hardware manufacturers or independent software houses.

But at the same time, U.S. users appear willing to share programs and other systems either through informal organizations or through more formal users groups organized by the computer makers.

Still, the profit motive is stronger in the U.S. and often money-saving software or ideas are sold rather than given away to other users.

Semenkov also said most difficult software was generally developed by cooperative projects between the computer manufacturers, the universities and the user.

Most of the software in the applications area, he said, comes from users directly, but he said in particularly hard projects the user could call on the resources of the industry and universities.

At the local level, sharing of programming expertise and other problems was carried out through local user groups, such as the Minsk Computer Users Association. These groups, he said, meet regularly to share completed work and discuss methods of running their operations more efficiently.

On a higher level, there is a National Association of Computer Users, which shares programs developed by the local groups and the manufacturers and universities.

This group, he said, meets annually and tries to identify areas where systems are operating inefficiently in order to set up projects to overcome those problems.

In addition, all programs developed in the country are cataloged and kept in a library. Every user had access to this catalog, he said, and can pick what programs he needs for his applications from the library for just the cost of duplication.

Because of this widespread sharing of programs, Semenkov indicated that the U.S.S.R. had had to establish some formal documentation requirements so users would be able to successfully use programs developed at the other sites.

Stressed in Schools

In another area, Semenkov said the Soviet educational system was presently putting a great deal of emphasis on the computer sciences. This process, he said, starts with the secondary (high) schools, where there are formal programs on computer design and programming.

The Russian people, he said, are paying more and more attention to computers – both the theory and practice of computation – because the machines are affecting the lives of the everyday people more and more as their use becomes more widespread.

There was an increasing emphasis on hierarchical systems, based on smaller computers at the local levels of the business reporting to larger and larger computer systems as data flows up to the national level, he also said.

This is particularly important in the Soviet Union, he said, because all planning is centralized and the central planning people must have accurate, up-to-date information on which to base projections and plans so they can allocate resources accurately.

There is also a move toward more factory automation, he said, not only to reduce labor costs, but more importantly to improve product quality.

In all of these moves there was a great deal of cooperation between the socialist countries of Eastern Europe, both in machine development and in the sharing of computer programs, Semenkov related.

In another area, Semenkov said after studying in the U.S. for six months he felt the state of development of computer science was about equal between the two countries, even though there are areas where the U.S. is ahead and areas where the Soviet Union is particularly advanced, especially in the theoretical area.

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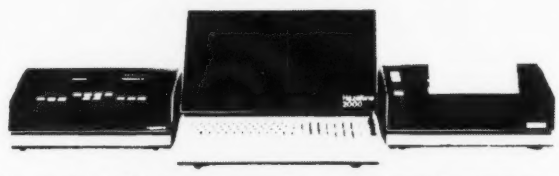

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Residents' Views Polled

VAN NUYS, Calif. – Congressman Barry Goldwater Jr. (R-27th District) is using a computer to find out what his constituents are really thinking.

Questionnaires containing 10 questions on current issues will be sent to residents in the 27th district. The results will be tabulated by computer using mark-sense equipment.

News Wrapup

Judges OK 15% Rent Hike in N.Y.

NEW YORK – A 15% rent hike ordered last May as a way of compensating for delays in the implementation of the city's computerized rent program was upheld recently by a panel of five Appellate Division judges.

The increase for tenants in 400,000 rent-controlled apartments was challenged by Bronx Borough President Robert Abrams and attorney Jerome M. Kay, but the challenge was denied on a technicality – the time to appeal (30 days after the original order) had expired.

Abrams and Kay claimed their appeal was filed late because the city did not adequately notify the public of its intentions not to appeal the original order. They plan to take the case to the state Court of Appeals.

Under the revised rent control law, rent levels were to be figured by computer for each apartment, based on its size, the building's operating costs and other factors. Any rent already below the level set by the computer could rise toward that level by no more than 7.5% per year, beginning Jan. 1, 1972.

Delays in making the computations provoked a lawsuit by landlords to raise rents by 15% effective July 1, for the remainder of the year, in order to compensate for the six months of lost increases.

According to Kay, those who would be eligible for the 15% hike are those for whom the computer has not yet set a maximum level. And he claimed it was unfair to raise these rates indiscriminately, since the level the computer will set for them might be at or below what they are paying now.

City Has Grand Success With Vote System

GRAND RAPIDS, Mich. – The first major test of the city's new computerized voting system was rated a success.

Final tabulation of the punch card ballots from 127 precincts in a recent primary was completed 1-1/2 hours faster than the previous presidential primary.

But approximately 3,000 city voters split their tickets, spoiling their ballots for the nonpartisan races and the proposals. City clerk Rawson Weaver noted that instructions telling voters not to split their ticket are printed on the test ballot and in the voting booth.

Computer Election Systems, which sold the city this system, said it was satisfied with the results and the new computer.

Researchers Not Worried by McGovernomics

ANN ARBOR, Mich. – "A McGovern-type [economic] program would imply additional growth in those sectors servicing consumer demands, a virtual elimination of the bureaucracy administering the current welfare program and – within the public sector – a shift in resource utilization from defense to other users."

These are the conclusions of a University of Michigan computer study on the economic reforms proposed by Democratic presidential candidate George McGovern.

The research was conducted by Harold T. Shapiro and Saul H. Hymans, both professors of economics and codirectors of the university's Research Seminar in Quantitative Economics (RSQE). The economists noted there is no need to worry about such economic reforms.

The evaluation, which used one of the four major forecasting models of the U.S. economy, was based on three aspects of McGovern's policy statements: a complete overhaul of the welfare system, tax reform and an income maintenance system and a substantial cut in defense spending, offset by increased revenue sharing.

Sure It's a UFO, It's Wednesday!

BOULDER, Colo. – If it's Wednesday, it must be a UFO.

At least that's how one computer study of 18,000 unidentified flying object reports sees it. More UFOs are sighted on Wednesday than on any other day, according to Dr. David Saunders, professor of psychology at the University of Colorado, who conducted the study.

"This finding should put to rest the idea that UFO sightings are the result of weekend partying and hallucination," he said.

The study also showed that most UFOs are sighted in the daytime, and that reports tend to come from areas where the education level is high, Saunders added.

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Nasis Looks at DP Systems — Part II

Formal On-the-Job Training Said to Give Best Results

By Edward J. Bride
Of the CW Staff

LEXINGTON, Ky. – The most satisfactory results in educating data processing workers came from "formal on-the-job training," according to several users in a recent survey. "Poorest results were identified from vendor-supplied training."

The users were DP officials in 43 states, and the above observation appears in both the 1970 and 1971 reports of the National Association for State Information Systems (Nasis).

The most recent report has just been published, after delays stemming from inadequacies of internal accounting systems, Nasis noted [CW, Sept. 27].

While manufacturer-provided training ranked low among the users surveyed, it was acknowledged that teaching aids, especially videotapes, provide flexibility to training staffs, "making their efforts more productive."

The new Nasis report also stressed the need for both management and user training, observing the latter was "growing rapidly and changing in approach."

For example, the "once-over-lightly" orientation sessions for users have now been augmented by a variety of courses, Nasis reported, including systems analysis, control of information systems and introduction to computer-communications systems.

"The need for management courses for top information systems personnel has been recognized," the report said, "with the objective of leading to more responsive design of management information systems."

The state users also reported a reversal in the trend toward the use of consultants, which last year was "growing more rapidly than almost any other individual, observable factor."

The growth is no longer taking place, but Nasis officials could not explain why; whether this reflects greater state internal capability or budget constraints was not clear, Nasis noted.

There is uncertaintly regarding in-house personnel counts and costs, too. These figures "may be becoming more elusive as advanced systems require user agencies of central facilities to handle their own data entry," the report speculated.

Partly as a result of this situation, careful definition of data entry personnel, "the largest single group in EDP," will be necessary to assure future comparability of personnel costs, the report said.

The only relative growth in the personnel/services area came in systems/programming groups, and conclusions here, too, are difficult, Nasis said.

The "increasing number and complexity" of systems account for the growth; the expected increases in productivity – in systems design and programming – have "not materialized to the extent desired," Nasis also explained.

System Transferability

While recommending the use of consultants to aid in the transfer of systems, the report said redesigning such a system from scratch for another state "reflects either on the consultant, on the second state or on both."

It was also suggested that a system resulting from a consultant contract should be public property, therefore facilitating transfer.

While joint projects financed by two or more states "hold great potential for low cost and timely systems development," little has been done in this area, the report proposed, adding there is some indication that federal agencies may promote this approach.

The Federal Government should also encourage, through financial incentives, the development of data element standards, the report said.

Calling the lack of such standards a "large problem" both within and among the states, the report suggested there was "no effort so deserving of joint state support as this one."

Throughout the report, the redesigning of similar systems was deplored as waste, and the high incidence of this redesign was well documented.

While there are a few notable achievements in the area of shared projects, states "separately approach the same general information systems problem," the report charged, "and go through the extremely expensive process of designing and implementing a system."

Acknowledging certain limitations to the applications listing, Nasis said the objectives in listing them were to establish a base for future trend analysis (of application development) and to promote transfer of systems design and/or programming.

The limitations, Nasis said, stemmed fron non-standardization in the words used to define the applications, currency of systems, ambiguities in response to core size, "and most serious, no information on systems outputs."

Copies of the complete report are available for $5 from the Nasis Secretary, Council of State Governments, Iron Works Pike, 40505.

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Customers Cash In With 'Mr. Cash'

By Edward J. Bride
Of the CW Staff

PARKERSBURG, W. Va. — People are cashing "checks" here without writing anthing, not even their own signatures.

A bank customer walks up to a "Mr. Cash" dispensing machine, inserts a checking-account card, keys in the secret code, asks for cash in $20 "bundles," and if his balance is sufficient, the customer gets what he wants.

The difference between "Mr. Cash" and other cash-dispensing machines is that "Mr. Cash" is on-line, so the customer's account is immediately verified and debited, and so, overwithdrawals are virtually impossible, unless they are intentionally built into the system.

This is the picture drawn by James Britten, vice-president, auditor and secretary of the Union Trust National Bank here. The bank is one of the three locations with "Mr. Cash" terminals hooked into a Burroughs B3500 system 100 miles away in Ohio.

There are other banks' cash terminals also tied into the same system, which dispense cash on-line, but they are designed not to cross banking lines, Britten noted.

The designation "Mr. Cash" is really the title of the Union Trust system, and not the terminal itself; a customer of any of the three "Mr. Cash" branches of Union Trust can obtain cash from his account through any of the terminals.

The technical lines between Union Trust and other banks could apparently be erased, if the participating banks chose.

Host site of the B3500 is Ohio Valley Data Control, Inc. (OVDC), which performs computer services for about 50 banks, including the half dozen with on-line cash-disbursing terminals, officially known as Burroughs RT 250ls.

Robert Bom, president of OVDC, said all 50 banks could probably be added to the system without danger of saturation, and a B2500 is being added for backup. With the additional processor and disks, there will be 80M bytes of information available for the banks, he noted.

The terminals now operate 24 hours a day, seven days a week and are probably used most heavily by night-shift workers without any other easy access to cash, Britten related.

In order to speed customer acceptance of the system, the bank mailed plastic checking-account cards, not credit cards, he emphasized, to all customers. To use the cards, however, a customer had to come to the bank, and receive a secret cross-checking number in a sealed envelope.

No one else knows these secret code numbers, and if the customer loses the envelope or his card, or forgets his number, he is issued a new one, Bom stressed.

If there are three erroneous inputs for account number, the machine "eats up" or withholds the card, since it is programmed to "assume" that the user probably is not the authorized holder of the card.

While the account cards are similar to credit cards in appearance, they also contain a magnetic stripe with three channels of information on the back, Bom said.

Automated Payment, Deposit

Checkless Payroll to Check In

By Marvin Smalheiser
CW Correspondent

LOS ANGELES — Computers will soon take some of the "twinges" out of bill paying for some Californians.

All they have to do is kiss their paychecks goodbye.

It isn't as bad as it sounds since the idea is to eliminate payroll checks and replace them with an automated payment and deposit system which routes authorized deposits and payments through automated clearinghouses in Los Angeles and San Francisco.

Banks throughout the state are now gearing up for the new service, scheduled to start Oct. 16.

The system won't make California checkless but it is intended to cut down the amount of checks handled in the state now and in the future.

Benefits claimed for the system are elimination of the risk of loss, theft and forgery of an employee's paycheck; elimination of time-consuming trips to cash payroll checks; elimination of paper handling for billing companies; and reduced check handling for banks.

Individual bank customers, if they choose, will be able to authorize their employers, who also must elect to participate, to deposit their pay into their checking accounts automatically.

The bank customers will also be able to authorize payment of certain monthly bills — some fixed, like mortgage and loan payments, and some variable, like utility and phone bills.

Payroll Tapes

Banks which initiate an agreement with an employer are called originating banks and will get tapes of the payroll of a participating company. The tapes will be run through the bank's DP facilities, extracting information about bank customers so their funds can be posted to their accounts.

During this procedure the originating banks will create punch cards, disk or tape as necessary for the automated clearinghouse.

This information will be sent to the clearinghouse, which edits the data received, sorts it and creates output to be distributed to banks, which will post credits for their customers.

These banks will process the information as if they were processing checks, entering it into the demand deposit accounting system and posting it to individual accounts.

Before a deduction is made by the banks from an employee's checking account, a payments notice is sent by the company to the customer, notifying him of the amount of the deduction, so he can challenge it before the deduction is made.

Processing of a payroll tape and distribution of the information through the clearinghouse should take about 12 hours on hardware furnished by the Federal Reserve Bank.

The hardware in the Los Angeles Automated Clearinghouse consists of an IBM 360/30 with 65K memory, two 7-track drives and four 9-track drives, a 1403 printer, one 2520 card punch, a 2501 card reader and one 2319 disk unit with three drives.

The San Francisco Automated Clearing House, which can exchange information with the one in Los Angeles, has an IBM 360/40 with 128K memory, some of which is used for the Federal Reserve District's activities.

There are also five disk drives and other peripherals similar to those in Los Angeles.

R. Gerry Belcher, vice-president in the systems development division of Security Pacific National Bank, Los Angeles, worked on the development of software for the clearinghouses.

"It is not a particularly complex system," he said. "Items come in one end of the system and go out the other. Some programs are large because of routing information needed."

Although officials don't know how many companies will sign up, it is estimated that about 180 million checks will be replaced by the system in the next three to five years.

Guardsmen Blank at Blank Checks

BIRMINGHAM, Ala. — About 300 Air National Guard members were stunned when they opened their paychecks for a 15-day summer field training exercise and saw blank checks.

While some must have been disappointed at the delay in getting the amounts filled in, others may have been tempted by visions of a super large paycheck, with the aid of a typewriter.

Apparently a 1401/1404 printer humming away in the Air Force Accounting and Finance Center in Denver, Colo., got a piece of paper caught between the print heads and the checks, which resulted in about 300 blank checks being issued, according to an Air Force spokesman.

Fill in Amount

The center contacted local accounting and finance officers and authorized them to fill in the missing amount on the checks. The amount could be determined by reading the punches on the cards. The officers checked this against the leave and earnings statement that each man receives and also against a listing of particular accounts prepared at the center. The amounts "checked out to the penny so there was no real problem except wasted time," the spokesman observed.

When a blank check was received by an individual and reported back to the center, all the men in that particular unit were called back in to have their checks filled in.

APB Out

An "all-points" bulletin was issued to other Air Force officers, since the center didn't know exactly how many blank checks were issued, but so far there haven't been any more reported instances, he said. The printers run through about 10,000 checks an hour, he added.

But those recipients who may be contemplating typing in a large amount on their checks might want to think twice: the processed checks are verified by the Treasury.

About 75 checks in the Birmingham area have not been turned in to the local base, but some of these may have been sent directly to Denver, an officer noted.

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Computerized Job Banks in U.S., UK Criticized for Failing to Do Their Job

By Joseph Hanlon
Special to Computerworld

Computerized job banks in the U.S. and the UK apparently have not improved the placement of the unemployed.

Early this year the U.S. General Accounting Office criticized the Baltimore job bank, and in the UK Department of Employment officials admit they have problems.

In both London and Baltimore, the computer contains a file of available jobs. Each day a book of jobs is printed out and sent to each employment office in the area; the employment counselors use the jobs books rather than previous file card systems to find suitable work for applicants.

It was hoped that more rapid and widespread distribution of complete lists would mean more people actually placed, but this did not happen.

"In its first two years of operation, the job bank had no appreciable impact in the Baltimore area in terms of applicants placed," according to the GAO. The GAO found placement rates in Baltimore followed exactly the same pattern as in other non-computer employment services in Maryland: a drop of roughly 10% per year in the number of people placed due to the recession.

This lack of success occurred despite a 50% increase in jobs listed and a 10% increase in job seekers, both generated by the publicity of the new system.

In London, officials privately admit the job bank has not improved placement.

At its peak, the Baltimore job bank handled 67,000 job openings and 88,000 job applicants, placing 27,000 people. London handles approximately 400,000 jobs and one million job seekers each year.

The Baltimore job bank was a prototype and was established in May 1968. By June 1971, according to the GAO, identical computer job banks had been established in 88 metropolitan areas at a cost of $14.3 million ($2.6 million for computers and other equipment in fiscal 1971 alone.

GAO Cites Advantages

Despite failure to meet its primary goal, the job bank did succeed in two ways, according to the GAO: its complete centralized list of jobs means that applicants no longer have to go to more than one office, and controls added to the system limit the number of people who can apply for one job, thus ending the previous problem of overreferral.

The only GAO recommendation relating to the computer was that training opportunities also be listed. Most recommendations related to counseling procedures.

Computerized Job Matching

On both sides of the Atlantic, however, more computerization may be the answer. Work has been progressing for some time in the U.S. on computerized job matching, and this month the UK Department of Employment (DOE) will begin testing its first system.

Job matching is done in the same way as computer dating. Both jobs and applicants are listed in the computer and matches are made based on the applicants' qualifications and desires.

The British system, for the national Professional and Engineering Register (PER), should be implemented in March after a six-month test.

Data on jobs and applicants will be mailed to the central headquarters and input; once a day, in batch mode, the computer will match jobs and people, and the results will be sent back to the local offices. Both jobs and individuals will remain in the file until removed.

The minimum time for a match will be about a week, largely because of postal delays, but this is not considered critical for professional jobs.

Computer Discriminates?

The PER system, however, has been criticized by some officials who maintain it may actually increase discrimination.

The system will take into account an employer's restrictions on age and sex.

The next step in computerized job matching is an on-line real-time for the London area, and a feasibility study is in the works.

According to DOE, it would replace the present job books with a dedicated computer. Each employment counselor would have a CRT terminal on his desk and jobs and job applicants would be input as soon as they came in. Thus the job match could be done while the applicant waited.

In-House Charging Saves for Patients

By Molly Upton
Of the CW Staff

RENO, Nev. – The Washoe Medical Center here can charge its patients an average of $32 per day less than comparable size hospitals charge in California through "hard work" and help from an in-house computer.

Careful reporting of charges, such as supplies and drugs issued and lab work, has played a large role in the savings story.

"By designing our own charge tables, which list frequently used items, the center saved $1,500 in one week," when the manual system was run parallel with the computer system, according to Bob Foster, fiscal director.

The nurses on the floors put a check by an item dispensed, or write in others on the patients' sheets. These are sent daily to where the corresponding item number is inserted. Not only are there more charges being billed, but the chance of error and the correction time involved have been reduced, Foster said.

'What You See'

Under the old system, numerous charges were missed, which meant that the patient paid a "premium." Now he pays for what he gets," Foster noted.

Originally supported by local tax funds from the county treasurer, the center started using a service bureau in 1965, and decreased its dependence on tax support in 1966 and 67. In January 1969 the center installed an NCR Century 100 and was completely off the tax roles in about a year, according to Foster.

The center now has an NCR Century 200, which is used primarily for patient accounting and payroll.

The turnover time for bills is "gradually going down," and the hospital is currently testing accounts payable, which it will use to compare budget and actual figures. "Without those items you can't really run a hospital unless you know where you're going," he observed.

After getting its in-house system, the medical center at one point procured prices from local service bureaus, guaranteeing savings over the in-house costs. But after the center showed what it was doing on its computer and the associated costs, the service bureaus "walked out," he said.

Besides equipment, Foster said the largest cost seems to be the keypunch department, and the center is looking into direct data entry.

Foster told his staff if "all the departments in the hospital could prove actual cash savings as of today of the amount it would cost us to get an on-line system, we'd go with it. We're roughly $30,000 short, but we're still digging."

Students Find Terminals to Liking

ROCHESTER, N.Y. – Researchers have found that a group of black students from an inner city school turned in better performances on tests taken on computer terminals than with comparable tests administered with paper and pencil.

A group of 20 seventh and eighth-grade boys, 10 black and 10 white, was divided in half, with one section taking the pencil and paper form first, and the other group the terminal test. Alternate forms of the Cooperative School and College Ability Test from Educational Testing Service were used. The test contained both verbal and quantitative parts.

Both black and white students did better with the terminal on the quantitative part of the test, researcher William Mihal said.

Greater Improvement

On the verbal part of the test, the black students showed greater improvement. The white students' performance deteroriated slightly, he noted.

Mihal, a student at the University of Rochester and author of the APL program, said he would not attach a great amount of significance to the fact that black children's performance improved more than that of their fellow students, but he noted that this was an area which seemed to merit more research.

Tex, About Your Sex Index...

STANFORD, Calif. – Feeling oversexed, undersexed, "sexed-out" or indifferent? A new computer application promises to provide definitive answers to these nagging questions.

A group of psychiatrists from the Veterans Administration in conjunction with Stanford University has announced the results of tests which are described as providing an objective method of measuring sexual stimulation.

Under the Veterans Administration test program, a dozen male and female volunteers allowed electrodes to be attached to their heads. The electrodes were connected to a "signal averaging computer" which measured their reaction to viewing photos of nude men and women.

When the viewer saw a picture of a "preferred sexual image," brainwave action increased and the computer was able to plot this increased action.

The main application of this new technique will be in the treatment of sexual psychopaths, the doctors said. Unfortunately this system is not on the market for general sale, but possibly some enterprising marketing man may be able to provide some commercial application – for example, erasing the problems of hit-and-miss computer dating.

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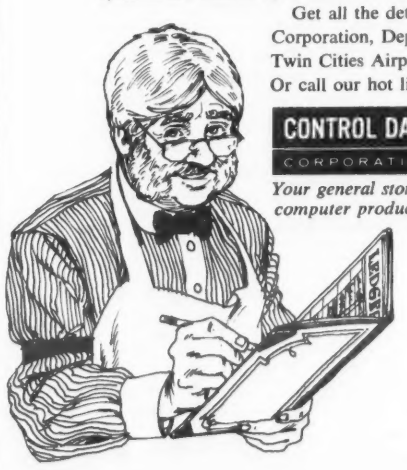

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Editorial

Time's Running Short

The first National Computer Conference is only nine months away, not much time for planning such a large undertaking.

But from what we hear, not much planning is going on yet.

The National Computer Conference is designed to eliminate many of the complaints heard about the Joint Computer Conferences (the last of which will be held in December).

It seems to us the very first thing that the American Federation of Information Processing Societies, the conference sponsor, should do is set up a steering committee composed of representatives of all the "vertical" associations, such as the American Bankers Association. Only by getting input from these "user groups" is there any likelihood that the NCCs will be any different from the JCCs.

All users share certain common DP problems. These problems should be identified and the conference program built around them, so that bankers can get fresh ideas from merchants, and vice versa.

If Afips' idea of "getting cooperation" from the vertical associations only means borrowing their mailing lists, the NCC will be still-born.

We call on all of the vertical associations to step forward and offer planning assistance to Afips – and to tell us if Afips rejects the offers and goes on acting like it runs the only game in town.

We need a National Computer Conference. We don't need another funeral. We had enough of them during the recession.

Let's get with it.

Letters to the Editor

IBM's Successes Due To Perspicacity

The Aug. 23 issue carried (1) a letter (page 8) condemning Vincent Learson's success at IBM, (2) an article by Shel Eglash (page 29) calling for "unity against IBM," (3) a report (page 31) on a proposal to "give IBM a free hand . . . outside the U.S. in exchange for limiting domestic growth," and other articles detailing the horrors of IBM domination of the information systems market.

We have all witnessed a "baby" (data processing) reach young adulthood in the past 20 years. We are now witnessing the parents of that "baby" confessing to poor management of the rearing of the child.

As a consultant to companies in the information processing field I have had an opportunity to witness great successes as well as abject failures of different companies trying to compete with IBM.

I recommend (I won't even charge a "fee") that the "gripers," "complainers," and managers of the failures look at the absoluteness of other government-controlled industries (railroads, postal service, transit companies, education, telephone) before they endorse similar control of data processing.

I also recommend they look back, with the 20-20 hindsight we are all blessed with, and see clearly that IBM's (and others) successes are not due to products or programs, but to perspicacity – or put another way – people.

IBM had the perspicacity to corner the market on high-performance personnel and the government won't be able to help us there – thank goodness.

Charles H. Taft
President
International Business Management Corp.
Marysville, Wash.

Cobol Aid Offered

Just a short response to the Aug. 2 Taylor Report. Although our college is about as far away as one could be, we have the capability of helping out on the Cobol research because of our unique curriculum structure.

Bob Peppin, Instructor
Data Processing Department
University of Hawaii
Karolani Community College
Honolulu, Hawaii

Aronoff Ohio Senator

Please note that State Sen. Stanley Aronoff [CW, Aug. 30] is not a California state senator; he is an Ohio state senator.

Terry McCarthy
President
Compugraphics, Inc.
Cleveland, Ohio

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

A Joint Effort

Good Management Is Attainable

Management
By Frank Greenwood, PhD

Management seems to be a collection of unconnected practices. This column suggests a *management system* to help you get people to work well in the interests of your organization.

Its focus is people, because people create the demand for your service, prepare the source documents, etc.

Just as an accounting system may be divided into modules (e.g., payroll, inventory), this management system is divided into modules of planning, organizing, staffing, directing and controlling.

The manager's philosophy on how to do business is basic. Ethics, objective decisions, performance evaluation and a service orientation are some of the areas where he must know what he stands for.

Planning

Near-term matters, such as software updates and processing schedules, force themselves upon us. In contrast, long-range planning seldom demands – or gets – our attention.

It is a waste of time for the director of computer services to design a five-year plan by himself. It will never be implemented. The controller, for example, is entitled to plan where the accounting area is headed and the computer people do not have that authority. Therefore, planning is a joint effort.

The joint planning effort begins by defining enduring, general objectives (e.g., to employ people, machines and methods effectively to help solve the increasingly complex problems of computer users).

Next specific goals are determined. Stepping-stones to the general objectives, their operating targets usually include: demand for computer service, hardware, software, staff, space and budget.

Then, strategies for realizing these specific goals are chosen. Strategies concern the fundamental factors controlling success. For instance: user strategy, budget strategy and management strategy.

Last, operating plans are developed to guide the daily work so the computer function moves via the strategies toward the explicit goals.

Organizing

Insist on doing everything yourself and you limit yourself to a one-man business. Do things through others and your horizon is limitless. Organization is one of the keys.

Authorities and responsibility are basic. Overlook the necessity to preserve the equality of authority and responsibility and you will pay for it.

For example, if you allow someone to preempt your authority and make your decisions for you, you must then live with his decisions. Or, make decisions for your subordinates and then you cannot hold them responsible.

Staffing

A manager is the hostage of his subordinates, since he succeeds to the degree they perform. There may be born leaders, but the rest of us depend on careful selection and training.

Selection is thorny. Moving a good operator into programming, for example, may deprive you of a fine operator and saddle you with a poor programmer.

A rule for training is that you want a backup person trained for every critical position. (Your own promotion may be speeded if there is someone to step into your shoes immediately.)

Directing

Guiding others begins when the manager knows what he stands for. Also, he needs reasonable confidence, or else he may (unconsciously) demand flattery and "yessing," which is not productive.

The boss should take the leadership in producing sound policies and procedures, such as in the areas of what service users can expect and when the operating software will be modified.

The boss is responsible for providing resources (budget, disk storage capacity, etc.), so he must know how to compete successfully for them.

Leadership, motivation and authority are related and knotty. Wisdom here probably begins with the idea that most subordinates should be involved in defining their own objectives, participate in decisions and have autonomy in determining how to reach their objectives.

Controlling

Control consists of setting standards, comparing performance to standards and taking any necessary corrective action. Subordinates should be deeply involved in controlling their own affairs, which usually requires that certain operating data be given directly to them.

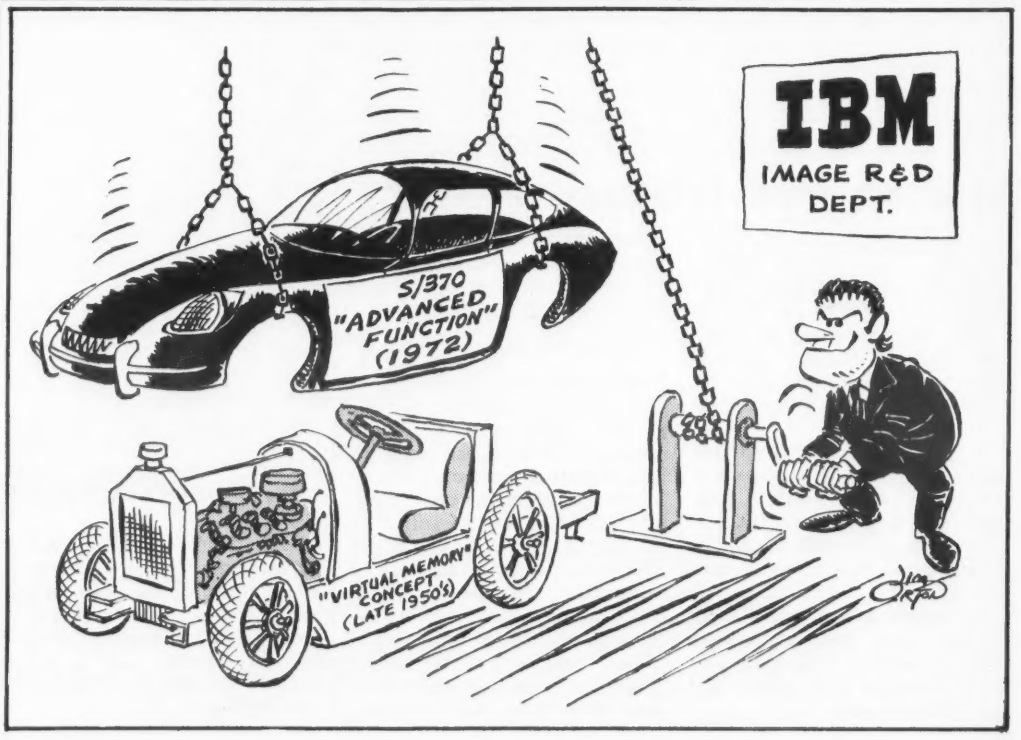
This system of management starts with the boss. He must want to establish it and he needs to know how.

He begins by defining his philosophy of how to do business. Then, he plans how to reach his objectives, organizes his resources, staffs the positions in this organization, directs the activities of the encumbents and establishes controls to ensure that performance conforms to plans. During all this he is straining to provide the necessary resources.

Good management is achieved by working consistently to make these simple concepts work. It is a thoroughly attainable aim, since it amounts to asking people to perform well in the task of earning their livings (in contrast to asking them to sacrifice their self-interest).

This column draws on: Greenwood, *Casebook for Management and Business Policy* (Scranton: Intext, 1968); and Bower, *The Will to Manage* (N.Y.: McGraw-Hill, 1966).

Frank Greenwood is director of the University of Montana computer center.



$8,000 Could Speed Up Availability Of New Concepts for Computer Buyers

The Taylor Report
By
Alan Taylor, CDP

Currently there is a lag of 10 years between the time major developments become available to computer buyers, and the time when the majority of such buyers actually obtains the use of them. This appears to happen no matter how valuable the concept.

The opposition computer sellers do not want to admit the values of concepts they have not implemented. Their salesmen's arguments confuse the buyers.

Because of the current belief in the technical supremacy of the equipment manufacturer over the very different field of the actual data processor, the validity of disputed technical virtues is not recognized and the concept is lost for years to most users.

VS – 10 Years ago!

This has happened many times. Take the recent IBM announcements of the new availability to IBM users of "virtual storage." New to them – true, but 10 years old so far as the users of the Burroughs 5500 (born 5000 and upgraded) are concerned.

And it has been used very successfully in many systems since then.

Yet anyone who was committed to the main line of IBM systems had no chance to benefit from virtual storage until now. Users had to use technically obsolete concepts even when they were buying new 1972 equipment!

Other instances of using obsolete concepts have been the ideas of multiprogramming (introduced in the late 1950s, but only accepted by users as valuable in the middle 1960s), microprogramming (introduced but not developed for user needs by IBM in 1964) and performance measurement.

And this is still the case with concepts that have been around for a few years. I don't know – but some reader may. And if you the reader know, then I want to know of these instances. I want to know of all potentially valuable concepts – unaccepted – that any reader is aware of – because I think I may have a possible method of reducing that 10-year time-lag! Here is how the method came about.

Wilmer's Call for Support

It all started when Dr. W.T. Wilmer ended a story praising universal host machines [CW, The Professional Viewpoint Page, Aug. 9] while urging users to support them.

He gave reasons like "unifying the industry" and others which had some reader appeal – but not too much. It was a good pitch, and probably a valid one – but it did not seem destined to get very far.

The pitch probably would not have gone very far either, but one of the responses he received urged unqualified support of the universal hosts. The reader argued that if the profession supports Wilmer and the hosts effectively, then the user will soon hear about other concepts that merit support!

That threw a completely different light on the matter. Support of the universal host idea over all other new concepts involved much expensive technical research.

But support of the idea simply to assure the profession of its usefulness to bring other good ideas to our attention – should do just that.

"If the profession supports Wilmer and the hosts effectively, then the user will soon hear about other ideas that merit support!"

The next step naturally was to learn how much support the concept of universal hosts would need, and how expensive it would be.

Significant Fact

The universal host systems do not use general-purpose machine codes, but instead use specialized ones. A specialized code can often execute work 10 times faster than general-purpose codes, while it needs only about half the same space to hold the same programs.

Universal hosts can contain a number of such codes (the B-1700 holds three internally) and can interchange in not much more than a normal instruction cycle.

As a result it turned out that support of the universal host concept would not be very expensive – from an industry point of view. The first need of effective support was to locate some immediate user decision which would be affected by the acceptance and understanding of the technical concept.

This was not difficult. The decision to buy one system or another often involves the use of benchmarks – and using a benchmark to compare universal host systems with others requires special precautions during the evaluation of the results. Already the evaluation should consider the possibility that the universal host system will constantly improve its performance everywhere – and may dramatically improve its capabilities in particular environments (such as Fortran executions or message switching) as specialized codes become available.

The actual performance of the system in achieving these ideals can be measured next year.

Nor is it simply the benchmark that is involved. The benchmark is involved because a universal host can be expected to improve performance over the years – and simply extrapolating future performance from a benchmark is now invalid. But so are a number of other standard comparisons – such as the memory sizes.

The "fair" way to compare system costs by setting the memory sizes equal becomes unfair! The universal host uses its memory more efficiently. The technique of comparing memory cycles also becomes invalid.

We can then significantly support the universal host concept simply by pointing these things out in a Guide to Evaluating Host Systems. That would cost about $3,000. We would also have to monitor its actual performance in the future and issue updates to the guide. That would cost about $1,000 a year and would be needed for about five years. The total cost of supporting the host concept therefore comes out to $8,000.

This seems like a worthwhile bargain – if it saves each U.S. computer user two years of the current lag-time in using the concepts, it would cost less than 10 cent/user/year for use of a new concept for each of the over 40,000 computer users. Do you know of any better bargains? I don't.

Nor do I know whether universal hosts are the best concept with which to try a pilot effort. It is worthy, all right, but is it the best?

It has some strong competitors I can think of. Measurement devices and programs – now that the Government Accounting Office has blessed them, may still have a claim as the first concept to be supported in this way. Terminal-based Cobol programming – such as is handled excellently on the Digital Equipment Corp. computers that I saw at Copley Computer Services in California – may be the right concept. I don't know. But the readers may.

If you do know of some worthy new concepts – or if you think any of these are particularly worthy of support – please send in the coupon.

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What Is Most Worthy Concept?

I think the available concept which is currently most worthy of user support is_____

because_____

Name_____

Address_____

Professional Position_____

Memberships_____

When completed, please return to Alan Taylor, c/o Taylor Reports, Computerworld, 797 Washington St., Newton, Mass. 02160.

While the IBM buyers of the newly announced 370/158 and 168 virtual storage systems waited for delivery, the pioneers of the virtual storage concepts in the B-5000s gathered to celebrate the completion of 10 years of operation of virtual storage systems. At the tenth birthday party Alan Taylor joins Irving Hough, Bob Creech, Bob Barton and Lloyd Turner in front of the still operational System 101.

Cobol Fund Is Growing

Taylor Updates

Primarily because of the gift of $500 by the Society of Data Educators the Cobol Support Fund organized by the Cobol Coordination Committee (Chairman Oscar Watts) has passed the $667 mark – one third of the way toward its minimum goal of $2,000.

The money is required mainly because of the unavailability – even within the Committee on Data Systems Languages area itself – of sufficient funds to allow for multiple copies of the essential documents for users.

The money is aimed at setting up sites throughout the U.S. – from New England to Hawaii – where sets of documents can be stored so users can have access to them when they want.

With the funds now assured, initial distribution of material to the selected National Cobol Documentation Centers is being prepared. The first consignment is due to leave St. Louis by mid October, and to become available for use at the start of November.

Included will be copies of the proposed Cobol standard, the current Cobol standard and, on microfiche, various other Cobol documents going back to the early 1960s.

This action will provide the Cobol community with a greatly improved access to the documentation – and so allow it to see that its interests are not being disregarded. But the project needs your help.

If you are interested in the idea of a truly effective common language – send your contribution to Oscar Watts, Automated Information Inc., 1627 Locust St., St. Louis, Mo. 63103.

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Professional's Viewpoint

'Education' Slighted in Furr Cup

By Thomas J. Cashman & Gary B. Shelly
Special to Computerworld

Certainly the Furr Challenge Cup Contest was a worthy effort to develop an increased interest in data processing education. However, some criticism can be directed at the criteria and the evaluation process of the contest itself.

Although the subjects of "professionalism," "student services," and "service to society" have perhaps some influence on the effectiveness of a school, we suggest the major emphasis should be placed on an in-depth analysis of the education offered at the school.

This Professional Viewpoint Page was prepared by the Society of Certified Data Processors in conjunction with the editors of *Computerworld*.

Traditionally, one of the most basic functions of any educational institution has been the "transmission of knowledge," It would seem that much greater emphasis should be placed upon "what is taught" at the DP schools.

Such measures as the length of the course of study, the equipment available for student use, the type of programming language taught, the number of hours of instruction spent in each area, the depth of knowledge acquired, and more importantly, the knowledge and ability of the students upon graduation should be used. As far as we saw, these were all but totally ignored in the evaluation.

The major responsibility which a DP school assumes when dealing in DP education must be directed toward the knowledge the student is to acquire when enrolled in the school.

It is the student who allows the school to be in business, and his capabilities provide the main contribution a school has to offer to the DP community.

By providing a thorough and meaningful curriculum to the student and then transmitting the information within this curriculum to the student in a manner which leads to a thorough understanding, the school has fulfilled its responsibility to the student.

Any less effort on the part of the school is depriving the student of the education to which he is entitled and the DP community of the trained people which it should expect to find as graduates of its schools.

Can students graduating from DP schools be able to develop the logic for a magnetic tape file update for a typical business problem, program the problem in Cobol or another programming language, develop properly prepared data to test the program, obtain and analyze a core dump of the program and expected output if the program fails to execute properly, and finally analyze the output to determine if the program has executed properly?

Because of the widespread use of disk storage devices the students should have had experience in programming problems involving the loading, retrieval and updating of records stored on magnetic disk and understand, and be able to utilize the various access methods.

The importance of operating systems in today's DP environment cannot be denied. Instruction in the structure and use of operating systems should be taught. We also expect the students graduating from the DP school can effectively use the job control language associated with the system, and can demonstrate the ability to compile, catalog and execute programs, and use the utilities, sorts, and other software available with the system studied. Certainly these are areas of interest to a potential employer.

We did not see these areas considered by the judges in determining the winners of the Furr Challenge awards.

The truly outstanding DP school must be able to fulfill its responsibility by providing competent graduates to the DP industry. We would hope that in future years the Furr Challenge Cup Contest will place greater emphasis on "Excellence in Education."

Thomas J. Cashman and Gary B. Shelly are on the faculty of the Liberal Arts College, Long Beach, Calif. They are co-authors of many books on data processing.

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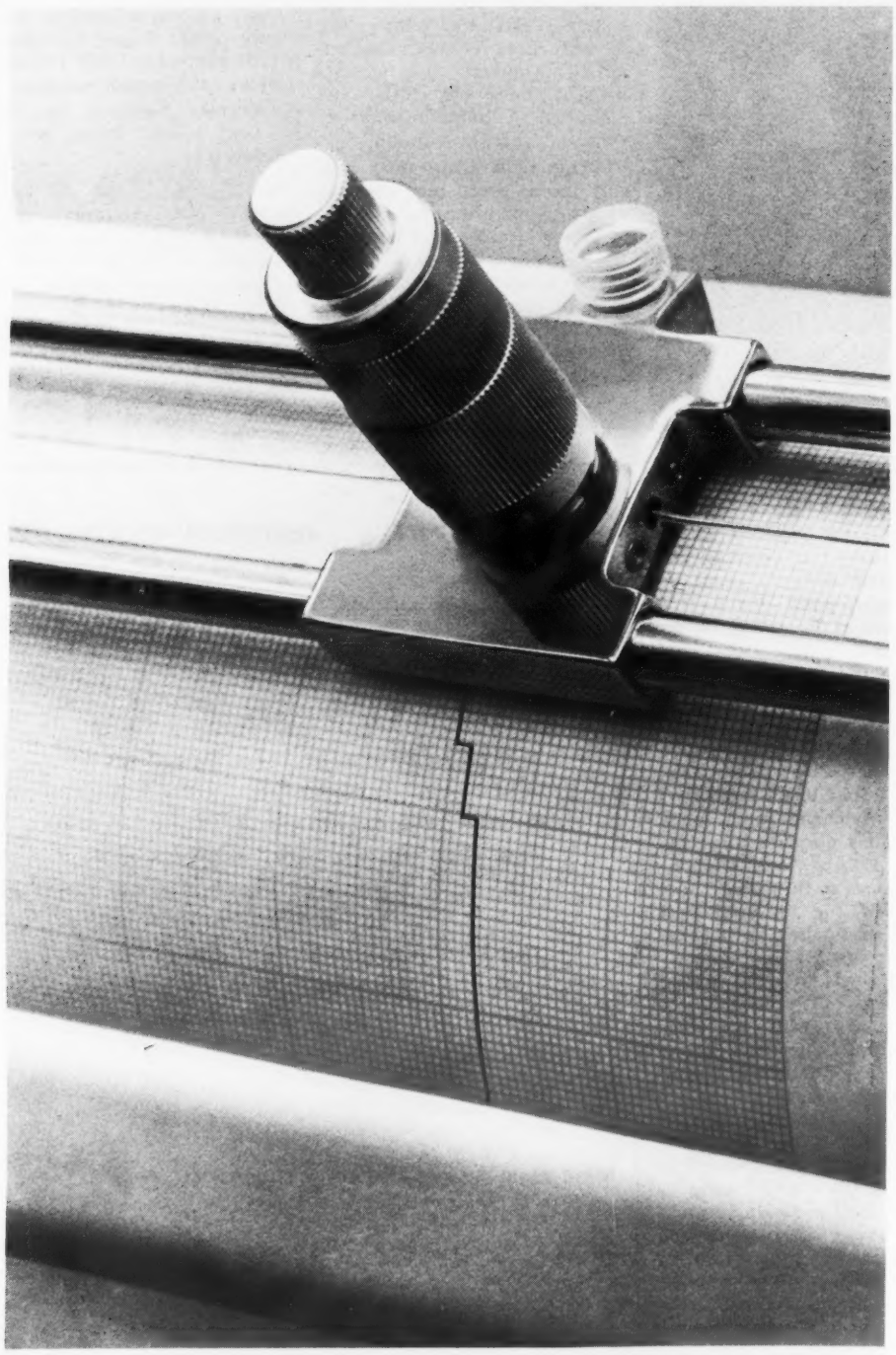

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Racial Balance Balancing

SPRINGFIELD, Ill. – The school board here has accepted a computer-based program through the state as a first step towards racial balance in the public schools.

The program aims to provide racial balance in individual schools with the least possible busing of students and the least expenditure of funds for transportation.

The plan, developed by IIT Research Institute, sifts through information on students' race, place of residence and school locations and proposed student assignments which meet the desired racial balance.

SOFTWARE&SERVICES

Random Notes

'Total' for H200/2000 CPUs Now Marketed by Honeywell

WELLESLEY, Mass. – Total 4, a version of the data base management system developed by Cincom Systems Inc., Cincinnati, is currently available from Honeywell Inc. as a separately priced program product for its H200/2000 series CPUs.

Cincom will continue to develop the product, but Honeywell will provide field servicing, under terms of a new marketing agreement between the two firms.

Based on a network structure that eliminates indexes and directories, Total 4 can be used under any of the Honeywell operating systems and requires a minimum 65K memory. It is available for $750/mo or a one-time charge of $26,500.

Isam Files Made Available To OS/360 Fortran Programs

PHOENIX, Ariz. – Fortran programmers working in an OS/360 environment are able to use Indexed Sequential (Isam) files easily, with a Fortran/Isam interface utility package now available from Western Data Sciences Inc. (WDS).

The routines support the creation, maintenance and use of Isam files. Written in BAL, they are CALLable from the user's program and allow the use of alphanumeric data files, with any length key. The key may be either inside or outside the record itself.

The package is distributed in source code, for $350, from WDS at 5055 North 12th St., 85014.

User Has Supervisor Choice

LYONS, Ill. – DOS/360 users can choose from up to nine separate supervisors on a single Sysres pack, with the Multi-DOS version 2 package from General Electronics.

Multi-DOS allows the user to add a new supervisor and test it without endangering the whole system if it fails. In that event, the user can select an alternate supervisor and continue, the company said.

The user selects the desired supervisor from a list printed at the console. Multi-DOS 2 costs $100 from P.O. Box 79, 60534.

Census Data Base Extended

NORWALK, Conn. – National CSS Inc. has extended its Censac, Census Bureau Data base and data manipulation service, to include Second Count, File A; Fourth Count, File A (Population); and Fourth Count, File A (Housing). The time-sharing service was previously limited to First Count, File A.

With all four files now available, users should be able to use the service to make decisions on marketing strategy, site selection, performance evaluation and long-range corporate planning, a network spokesman suggested.

Cobol '73–Part II

Needs Alter User View of Features

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – The wide range of changes proposed for the new American National Standards Cobol can illustrate the two schools of thought behind standardization efforts.

One school holds that the language features that have been tried and used heavily in the past should be stabilized for safe use by all, without fear of later radical changes in their application or their purpose.

The other school argues that since a standard includes both required and optional features, it is the best way to keep a language up to the "state of the art." With this approach, very new concepts should be encouraged by including them under the standardizations umbrella.

Implementors are not required to include every feature of a standard in their compilers, but this approach would at least provide a beginning so users who want to "try it – you'll like it" would have the same items on each "menu."

In any case, users trying to make useful comments on the proposed standards tend to have different ideas of what is most significant. This often amounts to what is most important to their own particular situation, rather than concern for the Cobol community as a whole.

Communications, for example, was cited by Richard Fredette of the U.S. Navy Programming Language Laboratory (PLL) as the most noteworthy addition to Cobol this time. The Navy is a widespread organization and it needs good, standard, easy-to-use methods of communications.

Communications was also the module Harry Hicks of Information Management Inc., and a one-time member of X3J4, mentioned when he spoke recently about the new proposal. But he felt the current draft would probably raise more comments and receive more criticism than other changes.

More Changes

The reorganization of the Random Access Module into two more highly structured modules was approved of by Howard Morton, one of Fredette's colleagues at the Navy's PLL.

Under the old standard, the compiler maker could create several different file access methods and the user would have to adapt his coding and his actual files to utilize a method for a given application.

But with this approach, files organized under one access method often could not be used under another manufacturers' compiler. Programs could not be easily transferred from one CPU to another.

Now, X3 proposes three very specific access methods, to be used by all implementors. These include one innovative method called Relative I/O. It is intended to allow records to be located by their relative position within a file, rather than through indexes, track, head and cylinder or any other locator technique.

'Aaims' Utilizes Power of APL, Provides Flexible MIS Facility

TRENTON, N.J. – An Analytical Information Management System (Aaims), recently released by APL Services as an interactive facility on the Action/APL network, is a tool for executives, managers and analysts to organize masses of data into meaningful one-line answers to queries, or tabular or graphic reports.

Developed jointly by American Airlines and APL Services, Aaims is a system of functions written in APL but expressed by the user in English sentences, to perform calculations normally on "time-series" data.

These are sets of numbers that represent the values of an activity or item at consecutive points in time, and are extremely important to the analysis of past business operations, and to the forecasting of future trends, a network spokesman explained.

Unlike some APL-based systems, Aaims includes support for stored files so the user need not enter data each time he wishes to perform a calculation or generate a report.

The files may be organized in whatever structure the user deems appropriate and all files used in a single Aaims analysis run need not be similar in makeup or even in the periodicity of the data, APL Services said.

The non-DP managers for whom Aaims is intended can maintain their files, again using English language sentences based on APL functions, without depending on support from their in-house DP staff.

The Aaims user has three types of commands at his disposal: general Action/APL system commands, Aaims commands and APL commands. The Aaims commands are intended to give him most of the capabilities he would want or need, and the ability to create new Aaims commands for his own use.

Aaims provides simple data retrieval through use of a DISPLAY command with various optional delimiters, including FROM, THRU and CUMULATIVE.

The full range of simple arithmetic operators is available under Aaims as are facilities to calculate ratios, determine moving averages and perform exponential smoothing.

A series of formatting commands allows the user to generate either tabular reports or plots, each with appropriate labeling either at the top of the printout or as captions for each line of plotted data.

In the area of statistical analysis, Aaims allows preparation of correlation matrices or calculation of single or multiple linear regressions.

In the event the advanced user is unsatisfied by the available Aaims commands or any that he may wish to create, he is free to drop directly into APL coding to accomplish his work, the network spokesman noted.

APL Services Inc. is at 865 Lower Ferry Road, 08628.

Sigma Users Gain IBM-Type RPG

EL SEGUNDO, Calif. – The IBM-style Report Program Generator (RPG) moved another step closer to becoming the industry standard for that type of support with the announcement by Xerox that "conventional, industry-compatible" RPG is ready for the Sigma 3, and will be available for the rest of the Sigma line in the first quarter of 1973.

Xerox thus follows the pattern set by Univac with its 9000 Series and RCA with the Spectra implementation of RPG. The same specification sheets are used by all of the Chinese copies of IBM's original 360 RPG.

RPG Superset

While Xerox's version provides all the "conventional" RPG features, it is in fact a superset of standard RPG. On the Sigmas, users can include and selectively execute subroutines written in other programming languages.

The Xerox version also provides the EXCPT operation code to allow output during total or detail calculation time in the RPG program logic. AND/OR logic to link two or more lines of code and support for "chained" operation codes also add to the new software's capabilities, the company said.

Xerox RPG is suited to work with indexed sequential as well as normal sequential files, a spokesman added.

The Xerox implementation operates on Sigma 3 CPUs under the Real-Time Batch Monitor operating system, and on the Sigma 5 through 9 CPUs. It is expected to run under the Universal Time-Sharing System (UTS), Batch Processing Monitor (BPM) and Xerox Operating System.

The software is provided free to Sigma users.

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More 'Hands Across...'

Tymshare Adds Paris to T/S Ring

CUPERTINO, Calif. – By adding leased-line service between Paris, France, and New York to its nationwide remote-computing network, Tymshare Inc. has given multinational companies with offices in both the U.S. and Europe another trans-Atlantic link for data handling.

Service between Europe and General Electric's computer center in Cleveland, Ohio, has been available for some time. And on Sept. 11, National CSS completed installation of a link between England and its 360/67-based center in Stamford, Conn.

'Ring' Approach

The Tymshare facility differs from the others, however, in that it is not tied to a single computer center. Tymshare utilizes a "ring" approach, with 22 large-scale CPUs accessible through more than 80 Varian 620-based communications processors throughout the U.S.

Along with Xerox 940s and DEC PDP-10s in the U.S., the Tymnet "ring" of CPUs now includes another 940 in Paris, operated by Cegos-Tymshare.

Access to the user's choice of mainframe, or the nearest one available, is provided by Tymshare's Network Supervisor System (NSS) software. It locates and uses alternate circuits in case of line failure between the user and the "target" CPU.

With its CPU array, Tymshare also lets the user set up a data base for all his operations, whether in the U.S. or Europe, at a site most convenient for him. European-based companies would most likely set up their files and programs in the 940 in Paris, the network said.

In addition to specifying which CPU he wishes, the Tymshare user can indicate the code he is using, whether Ascii, Ebcdic, Correspondence or Baudot. This will overcome any problems that might otherwise occur, should European offices want to use one code and U.S. offices another, the network said. The mini communications processors also handle differences in transmission speeds, the spokesman added.

NSS and the extension of service to Europe will allow better load leveling between the CPUs, and this in turn will mean better service to the user, Tymshare sources claimed.

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HARTSDALE, N.Y. – Project managers with access to a Decsystem-10 can plan, monitor and control large or small projects with Pert6, a software package that includes a scheduling subroutine, a report generator and an on-line inquiry facility. Developed by and available from Dynamic Solutions Inc., Pert6 is said to handle 4K activity records within any given project.

Each record contains task description, accounting and responsibility codes and resources required. Also included are expected fixed and variable costs; estimated, planned and actual start and finish dates; and month-to-date, year-to-date totals of actual fixed and variable costs.

The scheduling portion of the package functions within user-specified time and resource constraints.

The inquiry facility is just that. It allows the manager to get immediate status reports, for example, on year-to-date expenditures on a certain task.

Pert6 is written in Fortran and Assembly language for the Decsystem-10, where it utilizes from 2K to 21K words of memory.

The package costs $20,000. Lease plans are also available, the company said from 50 Lytton Ave., 10530.

Remote Trust Service Planned for Mid-'73

NEW YORK – Trust accounting and portfolio management, often cited as one of the hardest of banking applications, has been successfully installed on Marine Midland Services Corp. equipment and should be available to other banks by the middle of 1973, the company said recently.

The system provides a central file with all essential information on a user bank's trust accounts. Account reviews are produced on an overnight basis, using current market values of securities, with maintenance of tax-lot records on all holdings, a spokesman said.

The system is said to include "unique" methods of measuring the investment performance of individual trust accounts in terms of both income received and change in market value.

Developed for and in conjunction with Marine Midland by R. Shriver Associates, Denville, N.J., the initial implementation of the trust accounting is batch and remote batch-oriented.

Marine Midland Banks, of which the service company is a subsidiary, is at 241 Main St., 14203.

Sort, Source Statement Library Made Available to Cobol D User

LONG BEACH, N.Y. – Users still heavily committed to IBM's Cobol D compiler can gain a series of ANS Cobol features, through an extension package from International Computer Software. One of the most significant features in the package is support for program input from a system or private source statement library.

The package also includes the Sort verb feature, and sorted cross-reference listings. Users can make temporary updates at compile time and insert comments flagged by an asterisk in column 7 of the source statement card.

Programs residing in a source statement library are identified to the Cobol D compiler by a "Basis" card, just as they are with the ANS Cobol, a company spokesman said.

Control statements for temporary updating of a program at compile time allow the user to test a new routine before it is added to the stored version of the program.

The Sort verb feature allows dynamic communication between a Cobol D program and IBM's Sort 483 so that, in a single processing run, the user can access data organized in two, or more, different sequences.

With this package, the sort is loaded into high core and will return control to the application program after sorting the requested files.

As a byproduct of the Sort availability, this extension package provides cross-reference listing of all data names and procedure names, sorted alphabetically for easier use, according to the firm.

There is no restriction on the contents of Comments statements marked by an asterisk in Column 7. They are free form and may appear anywhere in the user's program, the company said.

The package can be purchased for $1,500 or acquired under a lease/purchase arrangement for $150/mo for 12 months.

The company is at 538 E. Beech St., 11561.

Singer Ten Replaces IBM 2780

SAN LEANDRO, Calif. – A Singer System Ten computer can be made to simulate an Ascii-oriented IBM 2780 as a terminal device, with the Remote Job Facility (RJF) software recently released by Singer.

The RJF package mimicks a 2780 with expanded buffer size and the Multiple Record feature. Card image disk files can also be used as both input and output for card data.

This means, according to Singer, that a user can update his source programs on disk, using Singer's Text Editor, after which he can transmit the program from the System Ten disk to the 360/370 mainframe for assembly or compilation.

From two to four of the System Ten fixed partitions (out of a maximum of 20) can be used by each RJF processing, with the actual number of partitions determined by user requirements.

As many as three RJF systems can operate concurrently on a single Singer CPU, the company said. Because the hardware does support multiprogramming, however, other jobs may occur at the same time as the RJF operations.

The RJF package is free to System Ten users, from Singer Friden Division.

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COMMUNICATIONS

Data Briefs

IBM Maintenance Drops 20% On 2702, 2703 Controllers

WHITE PLAINS, N.Y. – IBM has announced significant reductions on the monthly maintenance charges for users of purchased 2702 and 2703 communications controllers.

The reductions were part of a recent announcement which included a general increase in monthly maintenance and other rates [CW, Sept. 13]. The lower charge on each unit amounts to a 20% decrease for users.

The 2702 will now cost $46/mo, down from $57/mo, while the 2703 will cost $76/mo, down from $95/mo.

Data 100 Boosts Modem Simulator

MINNEAPOLIS – Data 100 Corp. has expanded the capabilities of its modem pair simulator.

The capability permits data transmission at speeds of 3,600 bit/sec and 7,200 bit/sec to accommodate IBM users replacing 2701 controllers with the IBM 3705, which has a top speed over voice-grade line of 7,200 bit/sec.

The modem pair simulator, a short-haul, high-speed modem replacement on private lines, can reduce costs as much as 25% over regular modems. It can accommodate synchronous serial data transmission for distances up to 10 miles on two sets of twisted-pair wire. The simulator previously handled speeds of 2,400, 4,800 and 9,600 bit/sec. The simulator with the added speeds remains priced at $120/mo with maintenance. The firm is at 7725 Washington Ave., 55435.

16,000 DAAs Installed

NEW YORK – About 20% of Bell System connecting arrangements installed since current interconnection tariffs took effect are operating on data communications lines.

Bell System figures, which include data up to the summer of 1972, show that more than 16,000 data access arrangements have been installed at users' sites.

The Bell totals show 9,400 automatic DAAs installed and about 6,700 manual DAAs operating.

Laser Used in Data Experiment

WASHINGTON, D.C. – Data communications by laser beam from the fringes of space is the goal of a two-month series of high altitude aircraft flights being conducted by the National Aeronautics and Space Administration.

The laser used in the aircraft transmits a visible red beam at a rate of 30 Mbit/sec. The high data rate is especially important in relaying information from satellite to Earth or to other satellites since data storage in space is limited, Nasa said.

ADL Study Says

Foreign Communications Still Limited

By Ronald A. Frank
Of the CW Staff

CAMBRIDGE, Mass. – While growing at significant rates, the impact of telecommunications facilities overseas is still very limited. The importance of data communications from country to country is directly affected by current backlogs of voice telephone installations, and the number of installed computers.

These are some of the conclusions in a worldwide telecommunications study recently completed by the firm of Arthur D. Little here. Covering all phases of telecommunications in 35 countries, the report revealed that data communications operations overseas are currently on a smaller scale than those in the U.S.

Japan Advanced

One of the most advanced countries in terms of DP services via telephone is Japan, according to the study. Users of about 200,000 Touch-Tone type phones in the Osaka, Tokyo and Nagoya areas can use their telephones as terminal devices to interact with the public data communication system. Three services are offered to subscribers, one for calculations, a second for inventory management management and sales and a third for scientific and engineering use.

To access a central DP site operated by the Nippon Telephone and Telegraph (NTT), a user places an overlay on the telephone key pad to indicate the required meaning of the keys for the service being used.

A description of the DP services of the Japan Information Processing Development Center (Jipdec) says subscribers to the engineering service, called Demos, can generate about 30 different Fortran IV commands from their phones with various combinations indicated by the overlays.

The subscribers can utilize either voice response or strip printers with their phones to receive answers to their problems. Messages are sent back in Katakana characters, according to the Jipdec description.

Subscribers to the time-sharing type services can maintain their files at the NTT DP centers and it is possible for a salesman in the field to access the data base, determine the current inventory of a product, calculate a sale and update the inventory all with one phone call, according to an ADL spokesman.

The charge for the telephone DP services is about $3.50/mo with added usage rates of $1/min, according to the study.

50 Bit/Sec Operation

While some Japanese services may be advanced, most data users are operating at 50 bit/sec and up until this year Japanese law prohibited the transmission of data on the dial-up network. About 18,000 modems are now in operation and some of these are connected to the 7,000 installed CPUs, the report said. NTT estimates expect about 240 on-line data systems to be in operation by the late 1970s.

In Europe much of the communications traffic is limited to messages transmitted on the Telex network. Most of the services available are part of the Datel private line network and the majority of the traffic operates off-line, the report showed.

In Germany the communications services are controlled by the government Bundespost telephone authority and some subscribers have to wait about eight weeks for Datel service, the report said.

Most of the data transmissions are operating at 1,200 bit/sec or slower and fees average about five times comparable U.S. rates for private line services, the ADL report said.

Rather than being a problem, the interconnection of data equipment to government-controlled telecommunications networks is welcomed in most countries, the ADL study showed.

In New Zealand the data user buys his own modem which is then easily type-approved by the government for operation on the telecommunications network. Few countries are concerned with the question of network integrity and potential technical harm that is retarding the growth of interconnection in the U.S., according to the study.

State Regulators Criticized For Inattention to User Needs

CAMBRIDGE, Mass. – State regulatory commissioners have come under fire recently from both state and national officials for their lack of planning to assure that the communications needs of telephone subscribers are met.

At a recent conference on regulatory information systems, Paul Rodgers, general counsel of the National Association of Regulatory Commissioners (Naruc), urged state regulators to make more efficient use of DP in their planning operations. To achieve this goal, Naruc has established a committee to study how DP can be most effectively used by state commissions, he said.

"Nobody knows which of our state commissions are working on what EDP projects," Rodgers said. "Only about five state commissions now have EDP applications worthy of the name," he said.

On the local level, Alan Posner, legal assistant to the Massachusetts secretary of consumer affairs, has charged that a "regulatory crisis" exists in the state Department of Public Utilities (DPU).

Speaking at the meeting of the New England Telecommunications Association, Posner told the users that the telephone division of the DPU consists of unqualified personnel who spend their time "putting out fires" instead of scrutinizing telephone company policies and planning to meet the communications needs of the public.

Data General Adds Multiplexer, Line Adapter to Nova Line

SOUTHBORO, Mass. – Data General Corp. has added a synchronous multiplexer, line adapter and communications software to its Nova line of minicomputers.

The synchronous/bisynchronous line multiplexer is a programmable interface that handles data transfers between Data General minis and four half-duplex or full-duplex synchronous data sets (Bell 201 or equivalent). The multiplexer can support several communications conventions, including IBM's Bisync.

Each multiplexer, which occupies one 15-in. square circuit board, can be used with up to four communications lines.

A single synchronous line adapter also is available at $1,200. The four-line multiplexer costs $2,500.

The multiplexer and line adapter are supported by no-cost hardware-oriented software subroutines.

The subroutines let the user set up his hardware to receive either a synchronous or a bisynchronous message, transmit a message or check the status of the multiplexer or line adapter. Utility programs that let a user check out programs are also included, the company said.

A number of the multiplexers can be combined with the firm's existing synchronous multiplexers to form a synchronous/asynchronous multiplexing system. This lets the user interface any number of terminals using the same programming format.

The products are available immediately, according to the firm.

Put a smart new employee on your payroll.

Our Sycor 340 can untangle your payroll, bring order to order entry, let you know quickly the status of your accounts, help forecast your sales, and a lot more.

Check out these features, then call Sycor to find out how inexpensively you can put a 340 to work in your operation.

• Up to 12K Bytes of total memory available, of which 3K Bytes are programmable Read/Write memory.

• T.A.L. (Terminal Application Language) for user programming of special routines as individual applications require.

• Low-cost batch communications on the public switched telephone network. 1200-4800 Baud speeds.

• Sophisticated binary synchronous communications procedures to detect transmission errors and automatically retransmit data.

• Unattended communications–no operators; overnight send, process, receive.

• More than 4000 job tested Sycor terminals in use in 33 countries worldwide.

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The Sycor 340 Intelligent Communications Terminal.

Bits & Pieces

Century 200 Users Offered Choice of Three Memories

DAYTON, Ohio – NCR is offering Century 200 users a choice of three new memory sizes. New sizes available are 48K rod memory and 96K and 192K core memories. With these additions, Century 200 systems come with a choice of 32K, 48K, 64K, 96K, 128K, 192K, 256K, 384K and 512K memories.

Century 200 processors with the 48K rod memory will sell for $28,000 and rent for $690/mo; the 96K core memory sells for $88,000 and rents for $2,150; the 192K unit costs $209,000 and rents for $5,100. Deliveries on processors with these new core size options will begin in January.

Varian Offers New Disk Memories

IRVINE, Calif. – Varian's fixed-head memory line offers fast transfer rates at low cost. The rotating, fixed-head-per-track disk is configured in four sizes, ranging from 61K to 491K word capacities. Transfer rate is 105 kword/sec.

The new disks are supported under the firm's Vortex and MOS operating system software. All units are rack mountable and completely compatible with the previous disk/drum lines. Prices for the systems are 61K at $7,000; 123K at $8,000; 246K at $9,500; and 491K at $16,000 from 2722 Michelson Drive, 92664.

Microfiche Reader is Improved

IRVINE, Calif. – The Macro-VU 230 microfiche reader from Gakken Corp. has been improved to handle greater speeds with a set of fiche positioning guides, and a fiche carrier with a positive stop and automatically opening top glass.

All common grid systems are offered. Five interchangeable GCA lenses provide magnifications from 20X to 48X. Image resolution is 6 line/mm. The $139.50 unit takes all flat film and aperture cards to 7-3/8 in. by 4-1/4 in.

The firm is at 17831 Sky Park Circle, 92707.

Color Monitor Costs $3,100

MINNEAPOLIS – A CRT color display monitor with alphanumeric and graphic capabilities is available from Miratel Inc. The TCR-25 displays multicolored graphics on a 25 in. screen and incorporates facilities for temperature compensation, individual regulated power supplies and solid-state circuitry and AFC (long and short). Other color monitor sizes are available, including the TCR-14, 14-in., and TCR-19, 19-in. models. Users can choose from Hi-Lite matrix or controlled phospor CRTs.

Color display terminals start at $3,100 from 1633 Terrace Drive, 55113.

Before Bema Board

Cassette Standard Awaits Confirmation

By Michael Weinstein
Of the CW Staff

SAN DIEGO – A proposed international standard for cassettes, to be voted on by a subcommittee of the Business Equipment Manufacturers Association (Bema), may ease user problems by assuring that all cassettes are designed to perform at uniform levels.

The new draft standard picks up where the old Philips standard leaves off. In addition to size, the new proposal specifies recording density (800 bit/in.), cyclical-redundancy-check character (CRCC), recording mode (phase encoded), two tracks (one at a time, side A and side B), tape length (282 ft minimum), inter-record gap (minimum of .7 in., maximum of 19.7 in.) and format (8 bit/char. with preamble and postamble for each record.)

With the new standard, users will be able to evaluate the characteristics that relate directly to specific needs. "What is the data transfer rate?", "Is the transfer easy to operate?", and "how easily will it interface with the present system?"

Once adopted, the standard will guide manufacturers in producing devices that will not become obsolete with continually changing models. The hope is to avoid cases of a cassette manufacturer designing a cassette-to-industry-tape converter to work only on a specified system.

There Are Problems

The proposed standard presents problems for both present users and manufacturers. Should users convert now to the new standard if they need new units or should they continue with equipment which may not meet industry levels once the new standards are instituted?

Will manufacturers redesign to meet the new specifications, which in some cases will obsolete present models, or should they wait until the specifications are formally instituted.

In any case, a standard is inevitable and steps have been taken by some manufacturers to meet proposed minimum performance levels.

DEC Releases New Cassettes After Rejecting Vendor Units

LOS ANGELES – Digital Equipment Corp. has released a new tape cassette system for its PDP-8 and PDP-11 minicomputers because "after spending a year and a half evaluating cassette units from outside vendors we could not find one that met our reliability standards."

During the search, none of the systems investigated was free of deficiencies, a DEC spokesman stated. Most of the units tested incorporated tape drives built using belts, capstans, pulleys and clutches which led to "jerking" and uneven tape movement, DEC said.

In some cases humidity was a major problem that caused the tape heads to stick.

With other units the problems were with the tape itself. Tape quality was so poor that users could only expect a cassette life of 10 to 100 passes, the spokesman said. These problems resulted in a data error reliability of less than the one in 10-million that DEC thought to be a valid standard.

Mike Leis, designer of the system, shows TU60 to Lee Bieberson of Peripheral Dynamics Corp.

DEC's new unit, designated the TU60 DECcassette, is claimed to overcome all of these problems. Uneven tape movement that results in jerking and stalling is avoided by use of direct drive.

Use of direct drive will result in a cassette unit that will operate for 3,000 to 6,000 passes without failure with the DEC unit being guaranteed for 1,000 passes, according to DEC.

Phase-recording on full-width tape that is twice the thickness of typical cassette tape will greatly increase reliability, the spokesman stated.

Tapes are coated by a "special process" that enables them to operate in environmental extremes with a minimum failure rate from dirt, wear and humidity.

The TU60 DECcassette the system stores 87K byte/cassette using 256 byte blocks and features a hardware redundancy check for error control. The TU60's electronics includes features such as bit-to-byte conversion, and cassette protection logic which prevents arbitrary commands from inadvertantly harming the tape, the firm stated.

The system has a transfer rate averaging 487 bytes/second at 256 byte blocks. Tape speed averages nine in./sec for read/write, 21 in./sec during search, and 100 in./sec during rewind. Typical full rewind time is 20 sec.

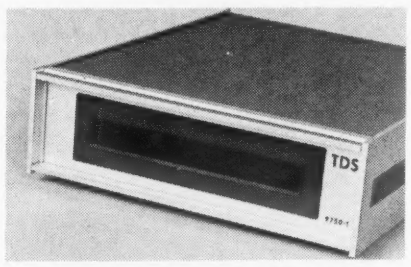
With either the TA8-E interface for the PDP-8 and the TA11 for the PDP-11 computer, the TU60 carries a single-unit price of $3,900. Quantity discounts are available. Deliveries for the PDP-8 cassette begin in November, in January for the PDP-11.

Displays Ease Message Tie-Ups

BRYAN, Texas – Texas Digital Systems' 9700 Series of alphanumeric displays provides visual display of computer-generated messages. This system, the "Informers," is most useful in the multiprogramming environment where operating systems can generate a large number of operator messages requiring action, the firm said.

The 9700 system is said to overcome machine-to-man communications problems. A display unit can be installed above each tape drive and at each mountable disk drive Other units can be used at remote locations where printers and card readers are located.

Each unit displays messages pertaining to the operation of its master device. Control messages, sent to the console operator are also rerouted to the proper display unit to prompt operator action.



TDS 9700 Message Display Unit

Software Changes

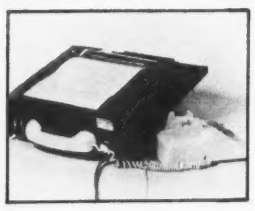
Minimum software changes are required for the display controller to handle all addressing transmission, data transmission and refresh all display units without further software intervention. Messages are automatically cancelled as soon as the requested activity is completed.

The 9700 series includes both parallel and serial devices that operate in local and/or remote locations and in both point-to-point and multidrop configurations.

Current pricing starts with a single stand-alone display unit at $684. A complete display system including device controllers, a computer interface and 10 local displays costs less than $5,100. The firm can be reached through P.O. Box 3701.

Make your getaway with a lightweight portable TELETERM®... at $3200.00 its a steal!

CDI's new 1030 TELETERM hard-copy time-sharing terminal puts computer power right at your fingertips. Anywhere, and three times faster than TTY. The CDI 1030 is rugged, simple to use and weighs only 22 pounds. All you need is an ordinary telephone and electrical outlet. Plug it in, dial up your computer and you're on-the-air. There's nothing else to buy. Period.



Model 1030 TELETERM®

If you don't want to buy a CDI 1030, lease it for as little as $99 per month.

Either way, get yourself a TELETERM or two. Then make your getaway.

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At these prices, I'm tempted to steal the 1030 TELETERM portable time-sharing terminal.

[ ] tell me how I can get TELETERMS immediately.
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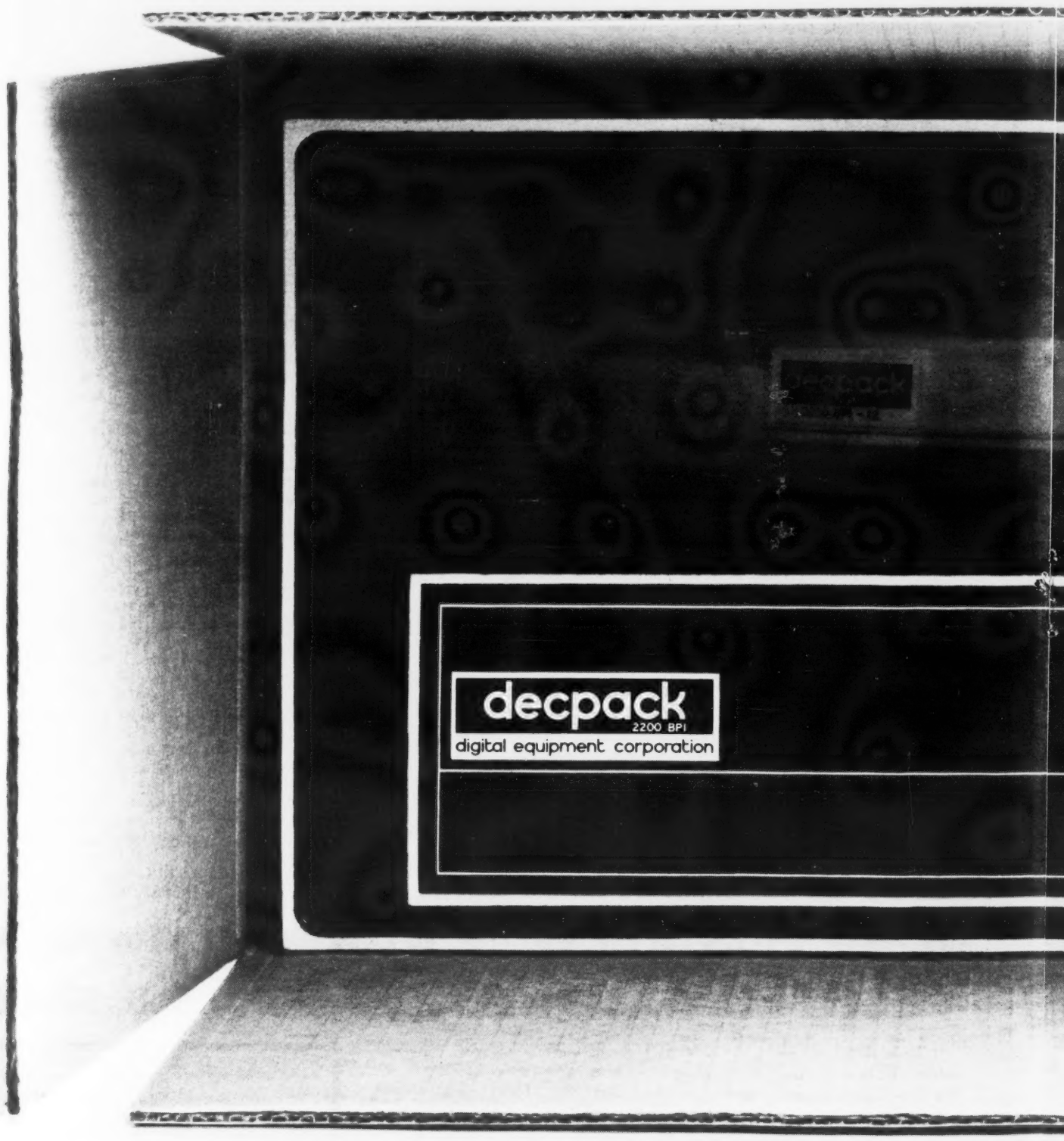
We couldn't help but notice how many people with our PDP-8's, 8/I's, and 8/L's really wanted to do more.

So we thought about all those sixty beautiful peripherals that had been made for the PDP-8/E. Discs. Magtape units. Line printers. Paper tape punch/readers. Communications equipment, A/D converters, cassettes, DECwriters, CRT displays, and on and on and on.

And their new low prices, many as much as 50% less than before.

So we've come up with a way to get everybody together. A $1500 interface that'll turn PDP-8's, 8/I's and 8/L's into 8/E's. It's called DW8E.

It makes them act just like they had



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an OMNIBUS™. Which means that almost all those PDP-8/E peripherals will just plug in.

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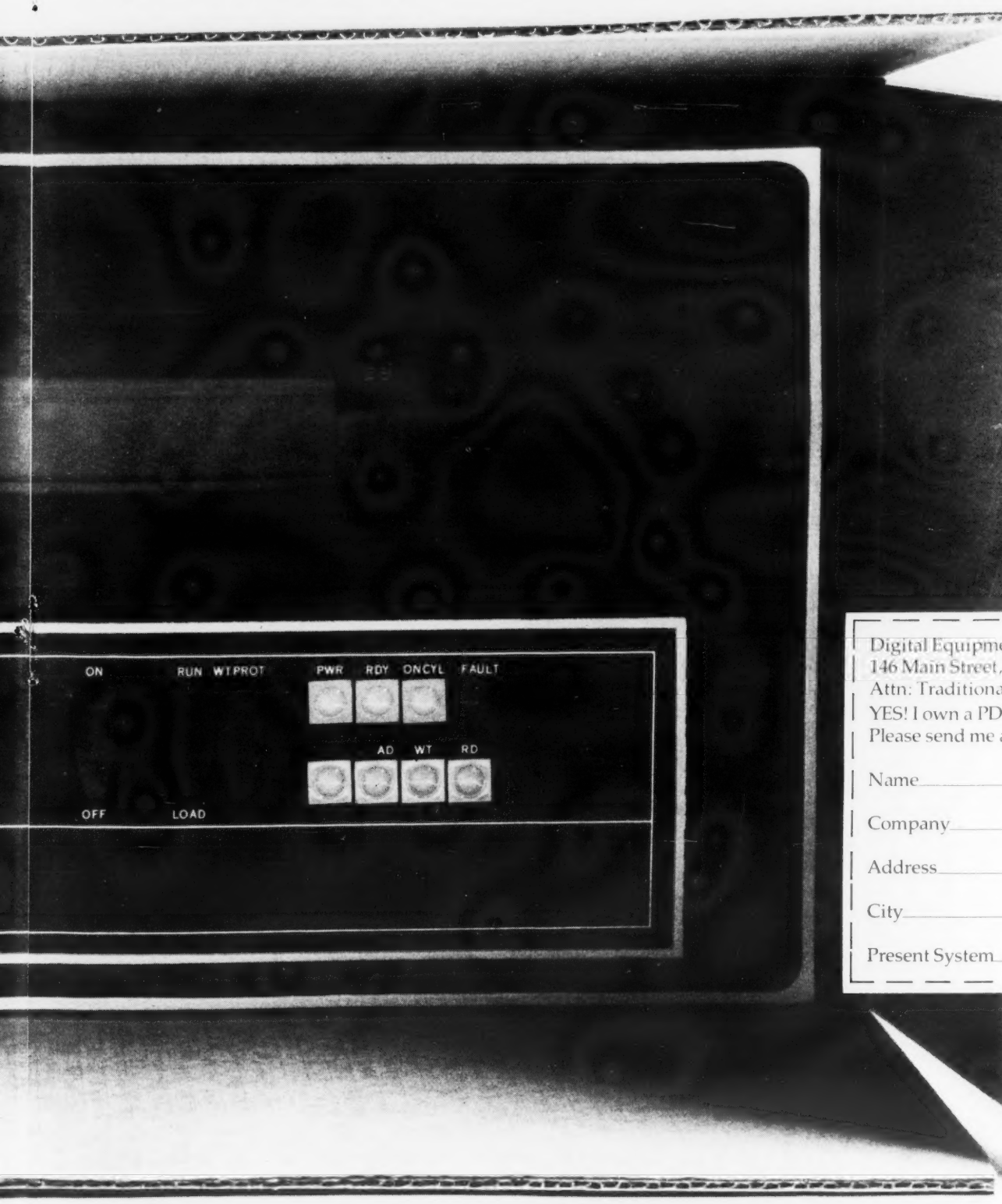

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YES! I own a PDP-8 that I might consider expanding. Please send me all the facts or call me at:

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City_____ State_____ Zip_____

Present System_____

Bits & Pieces

Interdata Users Offered Compatible Disk Memories

SUNNYVALE, Calif. – Interdata 3, 4, 5, 70 and 80 users can now obtain a compatible disk memory system from Data Disc, Inc. The Model 1734, a head-per-track disk memory peripheral, has a storage capacity in five levels from 131K to 2M bytes.

The disk system has an average access time of 16.7 msec and an average transfer rate of 125 kbyte/sec.

The 1734 communicates with the Interdata CPUs on the selector channel, with the system compatible with Interdata drum software. The system consists of a 7200 disk memory, power supply and a single-card interface controller. Mounting hardware and interconnecting cables are also provided.

The disk controller incorporates a 64-byte data buffer to allow asynchronous data transmission between the processor and the disk memory. Error check codes, a status byte, a current position status byte and a memory protect feature are included.

The 1734 costs $9,640 from 686 W. Maude Ave., 94086.

Genesis One Markets New Terminal

NEW YORK, N.Y. – Genesis One Computer Corp. will market the Wyle Computer Products Series 8000 display terminals.

These terminals are hardware and software compatible with the IBM 2260 display and feature 480, 960 or 1,920 character screen capabilities; local and remote configurations; up to 9,600 bit/sec data rate; non-destructive cursor; format protect; colon seeking tabs; character and line addressing; and special editing keys.

Unit rentals start at $260/mo for the controller and $80/mo for the display.

Printers Offered by Per Data

HICKSVILLE, N.Y. – A medium-speed line printer from Per Data Inc. handles 600 line/min in 80- and 132-column models as well as a variable length model to accommodate paper widths of 3-1/2 in. to 19-1/2 in (maximum of 132 columns).

The impact print mechanism produces up to seven copies and includes the standard 64-character Ascii font. Printer and interface are packaged together. Complete documentation covering operation and maintenance is provided with each printer.

Installations are available for any of the following: Honeywell 316, 516; Nova and Supernova; Varian 620/i, 520i; DEC PDP-8 and 11; Hewlett-Packard 2114, 2115A, 2116B; and IBM 1130.

The fixed 80-column printer costs $10,500; the fixed 132-column unit sells for $11,525; and the variable width printer costs $12,790 from the firm at 102 New S. Road, 11801.

Tape Produced by Typewriter

HAUPPAGE, N.Y. – A new converter that will produce computer compatible tape from an editing typewriter is available from Redactron Corp.

The converter re-records data from Redactron editing typewriter cassettes and magnetic cards into tape so that data can be entered directly into a computer. Data from a single recording can be entered as a file or a group of files.

Prices for the converter start at $13,600 from 100 Parkway Dr. South, 11787.

Data Entry Outlined in Brochure

LOS ANGELES – An eight-page brochure is available from Computer Machinery Corp. outlining the operational and performance features used in the Keyprocessing concept of computer-controlled data entry.

A copy can be obtained by writing to Computer Machinery Corp., 2231 Barrington Ave., 90064.

On-Line Braille May Improve Life for the Blind

WEST HENRIETTA, N.Y. – Within the foreseeable future, computers will be used to provide on-line Braille information to any blind person.

The Braille devices would be used either to provide texts through local agencies or to translate standard transmitted text into Braille.

BD-3 Embossing Device

Two such devices were recently demonstrated at the annual Convention of the Association for the Education of the Visually Handicapped. The BD-3 paper tape Braille-embossing device and the LED-1 page-embossing device were linked to a computer in New York via telephone lines to illustrate this new capability.

The BD-3, a portable terminal, can hook up to almost any data device (computer, typewriters, digital analyzer) and produce on-line tape Braille text. The LED-1 is the first of a series of full page-embossing devices and was demonstrated with a capability of 15 char./sec.

A new LED-120, scheduled for release this December, will operate at 120 char./sec. or 180 Braille line/min.

Invented to Help a Friend

The BD-3 was developed by a group of Rochester engineers as a hobby project to assist a blind fellow employee. Having developed the initial system the engineers realized the device's importance and wanted to offer it to the blind community at large.

The Association for the Blind of Rochester and Monroe County was approached and agreed to underwrite all development costs in return for the marketing rights. The association is a non-profit Community Chest agency.

For Job Placement

The New York State Commission for the Blind and Visually Handicapped has endorsed the BD-3 and has said it will purchase these devices for blind persons in cases where it will "help any blind person in New York State secure employment or vastly improve the quality of work on the job."

The BD-3 sells for $1,850, the LED-1 for about $3,500, and the LED-120 is scheduled to sell at about $7,500, from Triformation Inc., 39 Yosemite Circle, 14586.

BD-3 Portable Braille Embossing Device

Virtual Release Includes 4 New Operating Systems

By John Hunter and Dan Tanner
Special to Computerworld

Virtual memory eliminates the prohibitive costs involved with real memory to develop on-line systems and study their feasibility.

When practicability is established for a particular application, the real storage investment can be made appropriate to the desired system response level; if the CPU is powerful enough and the paging device fast enough, the real store need will still be less than would have been required for a non-virtual memory system. Overall, communications use should increase, perhaps dramatically.

Operating Systems

IBM's Aug. 2 announcement included four new operating systems (one of which is more of an operating facility than an operating system) and a new file access system. The operating systems present logically extended growth paths from former operating systems used with System/360 and 370, and two of them – OS/VS1 and VM/370 – are usable across the entire new machine range.

The file access method, Vsam, is compatible across all four new operating systems and with Isam.

Each operating system's job control language is compatible with its designated predecessor in the correspondence scheme of DOS to DOS/VS, OS/MFT to OS/VS1 and OS/MVT to OS/VS2. The remaining operating facility, VM/370, runs one or many operating systems of the aforementioned types.

DOS/VS is a greatly enhanced version of 360 DOS. Its principal features are: support of virtual storage; increased problem partitions from three to five; ability to specify the dispatching priority of a partition; a relocatable loader; spooling of I/O; and cataloging sets of job control cards.

For the most part, DOS/VS goes a long way towards solving the shortcomings of 360 DOS, especially with the introduction of spooling (via Power). Scheduling by priorities, not possible under DOS, can be implemented via Power.

In addition to basic Power, a remote option of this program lets users submit batch jobs via remote IBM 2780 or 2770 terminals. In this case, remote and basic Power work in tandem.

The selection of Power, or more exactly, Power's characteristics, as the spooling vehicle should be welcomed with some reserve. Power is a large program, requiring approximately 18K bytes.

Virtual Storage Part III

Further, it does permit asynchronous execution of problem program and output as do some of the smaller, independently developed DOS spooling packages (Grasp, DOS, Asap, Spooler, Sprint). Consequently, storage overhead is increased to hold the spooled data.

OS/VS1 includes support of virtual storage; improved management of peripheral I/O operations; improved remote job entry; and a new job-scheduling technique.

The latter feature is significant for it eliminates initiator contention for the job queue which exists under MFT.

OS/VS2, a functional extension of OS/MVT, offers support of virtual storage; protection of up to 63 independent jobs; and dynamic loading.

VM/370 is an enhanced carryover of CP-67 used with the time-shared version of the 360/67. Both an operating system and a multiaccess time-shared facility, VM/370 permits users to develop virtual machines – i.e., a simulated functional equivalent of a real System/370.

The VM/370 control program manages the resources of System/370 to create and control multiple concurrent virtual machines that can run under different operating systems.

In effect, the user appears to have access to the complete functional capabilities of the System/370.

Virtual Storage Access Method (Vsam) is a disk-accessing method designed to be a functional replacement for the oft-maligned Isam.

Mainframe

Briefly outlined is the important detailed information on configurations. For further clarity, only additions to, or distinctions from, earlier System 370 models are reported.

Model 135 – No new storage sizes or devices are introduced. A new integrated file adapter (IFA, feature 4655), mutually exclusive with the IFA for 2314-type disk drives, allows direct attachment of 16 disk drives of 3330 type in up to two subsystems. The new IFA requires 10,192 bytes of reloadable control storage.

Model 145 – No new storage sizes or devices are introduced. A new series of stand-alone storage units (3345 Storage and Control Frame, Models 3, 4 and 5) includes an ISC for 3330-type disks.

These can coexist with an IFA for 2314 types on the CPU and up to 16 drives can be attached in one or two subsystems. Optional 2-channel switching of 3330 types between Model 145 channels or between ISC and channel attachment on another System 370 (any model) is available.

Switching the ISC-attached disk subsystem does not affect storage in the 3345, which remains with the Model 145.

Model 155 II – No new storage sizes or devices are announced. Changing from Model 155 to Model 155 II includes only those features previously discussed.

Model 165 II – No new storage sizes or devices announced. Changing from Model 165 to Model 165 II includes only those features previously discussed. Model 165 II minimum main store is 1,024K bytes.

Model 158 – Minimum main store size is 512K bytes, increasable in half-million-byte increments of 2,048K bytes. A new CRT console is standard, but a new 3213 printer for console hard copy is optional.

Additional console support is also available from the IBM 3270 series of display units. A new ISC permits attachment of up to 32 disk drives of 3330 type in up to four subsystems; the channel switch option permits sharing of subsystems with other System 370s. Extended-precision floating point is now permitted with 7070/7074 compatibility.

Model 168 – Minimum main store size is 1,024K bytes, increasable in 1 M-byte increments to 4,096K bytes. ISC attachment of up to 32 disk drives of 3330 type in up to four sybsystems is possible; 2-channel switch features are also available.

The authors are associate editors with Auerbach Computer Technology Reports.

This series has been abridged from a detailed study of IBM's Advanced Memory, available from Auerbach Inc., 121 N. Broad St., Phila., Pa., 19107.

Model 980A
$3,475

Quantities 1 to 100
with hardware multiply and divide
and many other built-in standard features

TI continues its leadership in price and performance with the new Model 980A general purpose computer.

The 980A, as with the 960A, is a fast, powerful and flexible 16-bit computer at a low unit price with all the features, built-in and *standard*. Consider these many standard features, compare the price and you'll see why the 980A is the most cost-effective general purpose computer available today.

- ☐ Hardware, multiply/divide with 16 or 32-bit add and subtract
- ☐ 750-nsec add immediate
- ☐ 5.25-μsec multiply
- ☐ 750-nsec, full-memory cycle time
- ☐ Bit / byte / word / byte string data addressing
- ☐ Memory parity
- ☐ Programmable memory protect and privileged instructions
- ☐ Power fail/auto restart
- ☐ Power supply to support 65K memory
- ☐ Memory biasing (dynamic relocatability)
- ☐ I/O bus with 4 ports basic (expandable to 14 in basic chassis, 256 overall)

CPU with 4K memory	**$ 3,475**
CPU with 8K memory	**$ 4,975**
CPU with 16K memory	**$ 7,975**
CPU with 32K memory	**$13,975**

(prices are FOB Houston and do not include illustrated tabletop cabinet)

- ☐ Main chassis semiconductor memory expandable to 32K. (Up to 65K with memory expansion unit: Two weeks memory protect with optional battery)
- ☐ Full, lockable front panel with break point and 4 sense switches
- ☐ Switch-initiated ROM bootstrap loader
- ☐ Auxiliary processor port
- ☐ Direct memory access channel (expandable to 8 ports)
- ☐ Four priority interrupts standard (expandable to 64)
- ☐ 98 basic instructions (16, 32 or 48 bit)
- ☐ 9 addressing modes
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COMPUTER INDUSTRY

CI Notes

RCA Extends Univac Pact

BLUE BELL, Pa. – The Univac Division of Sperry Rand Corp. and RCA have reached a new agreement under which Univac can continue to place orders at least through June 30, 1973, for additional computer equipment needed by its Series 70 customers.

"The extension was necessitated by the continuing demand from the Series 70 customer base for enlarging or upgrading their present computer installations," commented John C. Butler, vice-president and general manager, Univac Series 70 Operations.

Hitachi, Singer OK Venture

NEW YORK – Hitachi and Singer have announced the establishment of a 50-50 joint venture that could eventually lead to joint development and manufacturing of equipment in the computer field.

Products to be marketed by the new venture presently include the Singer point-of-sale system, certain billing and accounting machines and calculators presently manufactured by each firm.

Future plans called for joint development and manufacturing of other business equipment.

CSC OTB Deal Updated

NEW YORK – Computer Sciences Corp. has finally signed a contract with this city's Off-Track Betting Corp. for the use of computer systems software and related betting terminals in OTB's automated wagering system. However, the contract can be canceled with 30 days' notice.

The contract, which replaces a letter of agreement from last year, provides for a cash payment of $2.7 million and a transaction charge of from one-third to two-thirds of a cent per transaction depending on the number.

Supershorts

Electronic Associates Inc. has purchased the assets and business relating to the peripheral products line – card readers, an optical mark reader and a card punch – of GDI Inc. for an undisclosed amount of cash.

– – –

Redactron Corp. has shipped its 1,000th editing typewriter, and claims the shipment makes it second to IBM in that market.

– – –

Microdata Corp. has acquired the exclusive worldwide marketing rights to the moving-head disk line of Western Dynex. The firm will market disk files utilizing the IBM 2315 and 5440 cartridges, with prices of $2,800 for the single disk and $3,100 for the double-disk system in OEM quantities.

– – –

Datum Inc. has entered the Japanese market through a distributor agreement with Teijin Advanced Products Corp., a newly formed Japanese venture.

Learson to Step Down, Cary Succeeds

By a CW Staff Writer

ARMONK, N.Y. – The old guard is now phasing out at IBM as T. Vincent Learson last week turned over the reins of the company to Frank T. Cary, effective the first of the year.

Learson will remain as a member of IBM's executive and finance committees, after stepping down as chairman and chief executive officer Dec. 31.

In making the announcement, Learson, who is 60, noted that Thomas Watson Jr. would also phase out his active participation in the firm when he reaches his 60th birthday in December of 1973, leaving the control of the firm in the hands of Cary, now 51.

The move also signifies a change in management from the old-line managers brought up in the EAM days of the firm (Learson joined in 1935 and Watson in 1937) to managers who have been with the firm primarily in the computer era (Cary joined in 1948).

Many in the industry felt that IBM under the past 16 months of Learson tenure had signaled a new "get tough" policy with the opposition, citing fixed-term leases and integrated controllers as evidence of this policy and Learson's reputation as a hard-nosed businessman.

But the take-over of Learson's two posts by Cary will probably not signal an end to such policies.

Cary was quoted recently as admitting that while IBM is not

. . . a little sailing, a little golf?

. . . more work, harder work?

CW Photos

against the competition, it is still after 100% of the business in the computer industry.

In making the announcement, Learson said: "When I was elected president in 1966, I indicated my desire to retire at age 60. Today I celebrate my 60th birthday, and I am delighted that the board of directors is honoring my wishes.

"My retirement is in line with a new policy the corporation will initiate, as of January 1, 1973, of mandatory retirement for all corporate officers at age 60. We all believe very strongly that in a business as technical and competitive as this, the interests of IBM will be best served by management teams of upcoming young men and women.

"The IBM Co. is extremely fortunate to have such a strong team of young executives, led by Frank Cary, who has been an integral part of the top management in the company for the past 13 years. No one understands better than Frank the dynamics of our industry, and no one is better equipped to give leadership to IBM."

Even though Learson explained the move primarily in terms of age, there was speculation in the computer industry last week as to whether or not this was the real reason for his retirement and the take-over of the chairmanship by Cary.

Some industry observers noted that Thomas Watson Jr. moved up to the chief executive slot just before the signing of the 1956 Consent Decree by IBM with the government in its last antitrust action, and they wondered if this move could be a replay of the past.

They noted that Thomas Watson Sr. was opposed to signing the decree, but his son felt it was the best policy for the firm at the time. These sources wondered whether Learson might have been opposed to any such move at the present, but that Cary might be more amenable to a settlement of the present antitrust case.

To back up this contention they noted the recent restructuring of the firm (see related story) along product lines would make it relatively easy to separate the central processor business from the rest of the organization – one remedy that has been suggested for a possible consent action in the government case.

IBM Restructures DP Group

ARMONK, N.Y. – In order to integrate product development and manufacturing operations, IBM has reorganized its Data Processing Product Group into three new divisions.

The Systems Development Division will be responsible for systems definition, architecture and systems management of IBM's principal computer product lines and for systems programming, the firm said, and will be directed by Bob O. Evans, division president.

The System Products Division will be responsible for the development and manufacture of central processor products and will be directed by Theodore C. Papes Jr., division president.

The General Products Division will handle peripherals such as tape units, disk files and printers under the direction of division president Dr. Arthur G. Anderson.

All three of the division presidents are also IBM vice-presidents.

Unaffected in the new move is the General Systems Division, headed by C.B. Rogers Jr. which is responsible for manufacturing and development of the smaller IBM computers, the System 3 and System 7.

Bubble Memories Advance At Bell Labs, IBM Sites

YORKTOWN, N.Y. – Two recent developments by two of the technical leaders in the computer/communications industry may facilitate widespread application of magnetic bubble material in computer memories.

In one of the developments, Bell Labs in Cherry Hill, N.J., has developed a computer-controlled method for growing the substrate for bubble memories and in the other IBM researchers here have developed a "simple" way of sensing the bubbles.

The computer-controlled system from the Bell researchers is used to grow gadolinium gallium garnet crystals "with greater control over the growth process and crystal diameter and at a lower cost than possible with manual methods," the firm said.

Crystals are manually made by slowly pulling a crystal "seed" out of a container of molten material.

In the automatic system a digital scale is used to record the weight of the molten material from which the crystal is drawn and a computer uses these readings to calculate the rate of change of crystal weight, which provides an indication of the diameter of the crystal as it is formed.

The new sensors from IBM make use of the phenomenon of magnetoresistance – a change in the electrical resistance of a material when its magnetization is changed.

The sensors in the patented process are tiny stripes of magnetic material whose magnetization, and thus electrical resistance, changes when a magnetic bubble is nearby.

By this process the presence of a bubble is converted to an electrical signal compatible with the electronic circuitry of computers, IBM indicated.

In a typical configuration, the firm explained, a thin strip of magnetoresistive material, permalloy, for example, is deposited directly on the chip in which the bubbles are contained.

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Eldorado Breaks Out Mini for OEM Market

CONCORD, Calif. – In a move that reverses the industry trend, Eldorado Electrodata Corp. has split its minicomputer out of its small business system and is offering it to the OEM marketplace.

The ee200 system, priced at $1,160 for the CPU only, features a universal bus which has space for 12 memory and/or peripheral devices in the basic unit, direct-to-memory access, priority interrupts, bipolar or core memory, 69 basic instructions, 16 levels of 16 general purpose registers, a bootstrap loader and serial Teletype interface, and a stack pointer for recursive programming, the firm said.

While the basic price is $1,160 for a CPU by itself, the price rises to $1,915 with 4K of core memory, and to $2,600 with 8K of core memory.

The software available for the systems includes assemblers, loaders and editors, a peripheral software driver, general utilities and debug packages.

Peripheral equipment available includes paper tape reader and punch, cassette drives, card reader, line printers, a 5 Mbyte disk memory, 7- and 9-track magnetic tape drives, and a general-purpose interface board, the firm said.

New OEM Products

Data Products Expands Core

WOODLAND HILLS, Calif. – The Store/225 core memory system from Data Products Corp. offers 32K words by 18 bits of storage on a single plug in module, with a cycle time of 975 nsec, and access time under 500 nsec.

The 32K by 18 bits can be arranged in parallel for a total capacity of 256K by 18. The memory has a 2-wire, 2.5D organization and is priced at less than 0.85 cent/bit in small OEM quantities from 6219 DeSoto Ave., 91364.

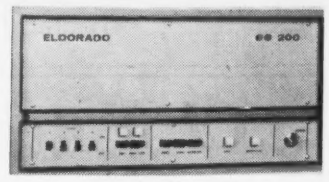
Other New Products

Digital Systems Services, Mountain View, Calif., has introduced seven sizes of add-on core memory for the HP 2114 A/B minicomputers.

Priced as low as 3.3 cent/bit in small quantities, the system is available in increments of 4K from 4K to 28K.

– – –

Douglas Electronics, Inc., San Leandro, Calif. is offering a basic interface breadboard, the 26-DE-8L, for use with Digital Equipment Corp. computers. The board with basic I/O components and circuitry installed costs $62. The etched board without I/O components costs $29.75.



Eldorado ee200

– – –

A family of multicolor/multipersistence CRT displays from Tasker Industries, Chatsworth, Calif., consists of a color display monitor which can be expanded to a stand-alone system.

– – –

The System I digital data recorders from Data Specialities, Inc. Highland Park, Ill., records BCD output of most digital instruments on paper tape in formats with any combination of 8 bit characters, at a price of $1,490.

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Recordings of either narrowband or 1/3 octave noise and vibration spectra are provided by the SD25-140 Paper Tape Control from Spectral Dynamics Corp., San Diego. The unit links real-time spectrum analysis equipment to a standard 8-level tape punch.

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Primary and secondary process control functions are combined in the dc² Dual Processor from Fisher Controls Co., Marshalltown, Iowa. The two units within the processor share the same data-gathering system but retain independent memories and I/O circuitry.

– – –

A line of pin-feed tractors from Unitech Computer Products, Inc., Melville, N.Y., is designed to control continuous forms at line rates of 100 to 2,000 line/min. Prices range from $8 to $50.

Contracts

Reynolds Securities, Inc. has signed contracts with GTE Information Systems' Ultronic subsidiary and Control Data Corp. for a $7 million brokerage communication system.

Computer Sciences Corp. has received two contracts from the U.S. Department of Health, Education and Welfare. One calls for CSC to develop a computer-based grants payment system for HEW's federal assistance programs. The other is for technical assistance to 12 states in implementing a control system used in evaluating state welfare programs.

Computer Products Inc. has received an $82,500 contract from Nasa for a digital-to-analog converter system to interface an SEL 840 computer to space simulation equipment.

Lucas County State Bank, Toledo, Ohio, has selected Automatic Data Processing Inc. to handle its payroll, accounts receivable, payable and general ledger services.

Computer Sciences Corp. has received a three year contract valued at over $6 million from Nasa to provide DP services at Goddard Space Flight Center, Greenbelt, Md.

Terminal Data Corp. has received an order from Eastman Kodak for microfilm recorders to be used in computer-to-microfilm systems.

Univac has been awarded an $8.3 million Air Force contract for maintenance of the 153 Univac 1050-II systems located at 133 U.S. Air Force bases around the world.

Computer Sciences Corp. has received a $300,000 contract from Rome Air Development Center, Griffiss Air Force Base, N.Y., to develop a compiler-building system that will reduce the cost of producing new Jovial compilers.

Information Sciences, Inc. has been selected by three Connecticut banks, Merchants Bank and Trust, Woodbridge Bank and Trust, and Lafayette Bank and Trust to provide DP services.

Logicon, Inc. has received a $1.2 million follow-on contract from the U.S. Air Force Space and Missile Systems Organization for engineering evaluation and software development on the Minuteman intercontinental ballistic missile system.

The Robert Hall clothing chain has selected Data Service Co. to provide maintenance for its DP equipment.

Data Products Corp.'s Telecommunications Division has received a $1.3 million U.S. Air Force contract for a Traffic Data Collection System for the overseas Autovon System.

Data Input Service Corp. has been awarded a one year contract by Boston City Hospital for conversion of patient medical records.

Riverside County, Calif., has awarded an $899,000 contract to Trans-A-File Systems Co. for a digital automated filing and retrieval system.

Trilog Associates, Inc. has received a systems engineering contract from Wells Fargo Bank, Calif., to implement a Trilog-designed system to handle the bank's employee benefit plan.

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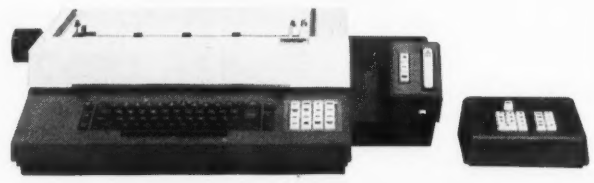

The Novar 5-50 and 5-60 communication terminals, and the 5-30 Automatic Tape Typewriter, have a built-in connector to which a number of auxiliary devices can be attached. One of these is the 5-02 Ten-Key Numeric Input which adds the capability to handle a wide range of numeric data, at a fraction of the cost of a separate system that performs the same functions.

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User Migration — Part II

User Moves Spell 'Trouble Ahead' for 360 Lessors

By E. Drake Lundell Jr.
Of the CW Staff

NEWTON, Mass. – The movement of users away from IBM 360 systems to the 370 line will have a tremendous impact on leasing companies for both those in the 360 market and those penetrating into the 370 area.

By the end of 1975, there will be nearly 10,000 370s installed mostly as replacements for 360 equipment, according to a recent survey by International Data Corp. (IDC), a market research firm here.

This nine-fold growth – from around 1,000 370s installed at year end 1971 – and particularly the advent of the virtual memory systems "spells trouble ahead" for the 360 lessors, IDC said.

"Even the initial 370 deliveries have caused mild churning of portfolios, but lessors who planned ahead and established capable marketing forces have had little difficulty keeping all their equipment in the field.

"This situation will undoubtedly worsen over the long haul," the firm predicted.

Through 1973, the firm said, the "leasing game will be easy," because leasing companies will be able to claim that discounted 360s are price/performance comparable with the available 370s.

"But this game will change. Indeed, IBM – in its announcement of virtual storage operation for the 370 – almost admitted that prior to Aug. 2, 1972 the 370 was simply a better 360. But no more. Virtual storage creates a one-way street. The user can easily move from 360 to 370; once there, however, he faces a series of lock-in devices," the firm said.

This is the second of a series of articles exploring the effects of the user migration from IBM 360 to 370 equipment on various segments of the computer community.

As a result the leasing companies will face dramatic returns of equipment coinciding with the disappearance of potential markets, the firm said.

Part of the market disappearance will be caused by rental customers (those who rent directly from IBM) returning their equipment.

IDC estimates that IBM's rental base of installed 360s will drop to around 2,400 machines by the end of this year, down by more than 50% from the 5,700 installed at year end 1971.

By the end of 1973, this base will have dropped to a mere 1,200 systems, the firm predicts further.

The lessors also will be losing some of their customers at the same time, although not as rapidly, the firm said, predicting a 2% drop in 1972 and a 5% to 7% drop in 1973.

However, "the third party leasing industry will have a major part to play as 360 users move to 370s, winning a continuing market position," IDC said, warning also that "370 third party leasing will not be as large in terms of dollars as that witnessed during 360 leasing."

While more than $2.5 billion worth of 360 equipment was acquired by the third party firms in the first five years of the 360, IDC predicted that only $1 to $1.3 billion worth of equipment would be purchased in a similar period of the 370's life.

But with the lessors actively seeking 370 contracts, IDC said lessors would place over $450 million in 370 leases during 1972, with the bulk of them being full-payout or long-term leases.

One of the major reasons for lessors' success will be that IBM has instilled a confidence in users that the 370 can meet the users' computing needs for the next several years, making users willing to commit to long term contracts for equipment.

Secondly, IDC said users of purchased 370/155s and 370/165s will find they can work up lease-back arrangements with the third-parties whereby users receive free virtual memory retrofits.

But while the lessors move into the 370 areas, they will have to contend with a large 360 portfolio.

To overcome this, lessors will have to try to maintain short term leases with users waiting for the move to 370 equipment, and who need extra equipment on a short term basis in order to meet their computing needs.

"Lessors cannot hope to forestall the inevitable demand decline for 360s – the 370s become more attractive every day," IDC warned, however.

Cheaper Data Hardware Seen as Field Develops

LOS ANGELES – The advent and growth of digital data transmission will result in cheaper transmission hardware as outmoded standards are abandoned or amended, Harold Norby of the data systems division of Litton Systems, said here recently.

In addition, he said the advent of domestic satellites will reduce the need for network TV transmission using the present microwave links, a move that should permit substantial capacity available for data users.

There will also be an increase in the bandwidth efficiency for all systems, he said, although PCM will never achieve the per link spectrum efficiency of single sideband-frequency division multiplexing (SSB-FDM) for voice if both systems are optimized.

There will also be an "increasing use of existing FDM transmission facilities for data via baseband modems, sometimes termed data under voice."

As to the future, Norby recommended the encouragement of the use of analog/digital systems on existing FDM links.

This, he said, "is more consistent with present voice/data capacity ratios and spectrum conservation given the inevitable use of domestic satellites for TV broadcasting."

Use Simple Modems

At the same time, he called for the development of bilateral transmission media with appropriate data, control and reverse channel and a de-emphasis on the use of voice band channels for data in favor of simple modems directly interfacing with TDM transmission equipment.

He also said there was a need for more research on how to effectively use CATV facilities along with other digital transmission media and a need to establish logical interface standards.

In order to meet his recommendations, he said there was a need to develop the following equipment: Digital microwave carrier modems; baseband modems; TV Slot modems; and local distribution modems.

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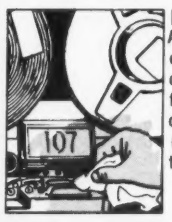

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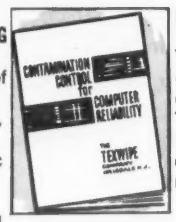

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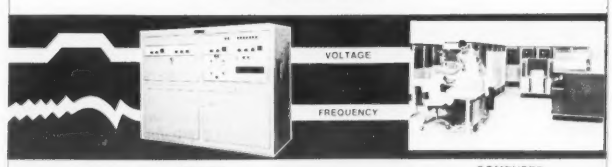

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Greater DP Use Urged in Medicine, Huge Market for Hospitals Outlined

By E. Drake Lundell Jr.
Of the CW Staff

LOS ANGELES – "As the absolute and proportionate costs of medical care rise, new equipment (such as computers) and instrumentation must be developed to provide the highest standard of health care at the lowest possible cost," Morton Schwartz of California State University at Long Beach said here recently.

Schwartz noted that in fiscal year 1972, more than $70 billion were spent on medical care – equal to 7% of the country's Gross National Product.

By far the largest portion of the health dollar, he said, goes for hospital services, which account for 38% of all the funds spent, making hospital services the most attractive market in the health care field.

By 1975, he indicated, the U.S. will spend over $100 billion on health care services, equal to approximately 8% of the Gross National Product.

The use of bioinstrumentation in the hospital environment "has rapidly expanded to the point where the routine hospital admission is highly dependent" on computers and electronics gear for EKGs, pulmonary function tests and clinical laboratory reporting, he said.

In addition, the recovery period "frequently requires extensive electronic monitoring of the patient's vital signs, and patient safety must be considered through total design of instrumentation systems at the bedside."

With more of this type of data being collected from the patient, computers must play a role in collecting, processing and storing the information for later retrieval and trend analysis, he said.

"By 1980, more than half of the hospitals with 200 beds or more will use computers for handling physiological data," he predicted, noting that "in 1972, half of these hospitals are already using computers for business office and accounting functions."

Automated Testing

Another growing area for computer applications will be in the field of automated multiphasic testing, he said.

"To compensate for the shortage of physicians during the '70s, the increased use of paramedical personnel will occur in the areas of multiphasic health screening exams and medical laboratories," he said.

"These personnel will be highly trained to do specific tasks and to use automated equipment in high-volume operations. The application of these procedures will result in a reduction of costs and will free the physicians to once again practice medicine and supervise personnel," he added.

But while there are great opportunities in the medical area for computer and other electronic firms, there is also a current wave of disillusionment with technology, according to Malcolm Ridgway, associate director of the biomedical engineering institute at the University of Southern California.

Economic pressures which have depressed the market in the past are now forcing a new direction, he added, toward regional resources sharing schemes among various hospitals and clinics.

At the same time, he noted, there was a trend toward a "broader concern for the health of the entire population."

Technology, he said, "will have to play a role in this larger scale of operation; techniques will be required for a more effective distribution of health care services and for collecting information so that benefits of alternative approaches to health maintenance can be assessed without delay."

He noted there is a large market for systems that could be used to allow "easy manipulation of data now contained in the traditional form of medical record."

Microcomputers Should Contain Electrically Alterable ROMs

LOS ANGELES – "Because of the difficulties of selective clearing and wearout which occurs with high-speed, high-voltage writing pulses, present non-volatile storage transistors are best suited to electrically alterable ROMs with block erase," according to Andrew Tickle of Nitron Corp.

"Non-volatile RAMs," he said, "are considerably more difficult."

Present non-volatile semiconductor memories "show reliable long-term data retention and may be used in place of conventional MOS memories," he said, adding that the operating speeds would be lower for such devices and that higher voltages are required imposing design constraints and more difficult processing techniques.

"In order to avoid wearout effects, lower writing voltages are necessary and differential sensing techniques are needed for reliability discriminating between small threshhold differences," he added.

"The use of N channel MOS," he continued, "will improve operating speeds; and the use of common charging electrodes may solve the problem of decoding high voltages on the chip."

Microcomputers

Such electronically alterable semiconductor memories will find their widest use in microcomputer systems made up of a combination of LSI microprocessors, programs storage (ROM) and data storage (RAM), according to Harold Feeney of Intel Corp.

In another area, G.C. Lockwood of NCR said electronically erasable ROMs could be used in low-speed data terminals for program control storage in place of small core memories and mask programmable ROMs.

They are economical, he said, "where a wide variety of programs are needed or frequent program changes are expected."

At present, he said, NCR has developed a 1K-bit electrically alterable ROM, and noted that future development would be aimed at increasing the number of bits per chip by "at least an order of magnitude."

Achieving this goal, he said, will require the following developments:

- Complete address decoding on the chip to reduce chip size and number of pins.
- Isolated substrate capability to retain electrical erasing with complete addressing decoding.
- Single transistor per bit data storage.
- A data sensing system which compares the stored threshhold level with a reference voltage to permit margining of the memory system.

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Growing Demand Seen for Mini Displays

LOS ANGELES – Recent developments in the area of graphic displays "have made the marriage of such displays to the minicomputer economically very attractive," according to Rudolf Panholzer of the department of electrical engineering at the Naval Postgraduate School.

"We may well experience another small revolution as the number of minicomputer-display installations rapidly increase," especially in the areas of education, science and business, Panholzer noted.

The use of graphic terminals will greatly increase the applications of computer-assisted instruction, agreed Alfred Bork of the University of California at Irvine at a recent panel session here.

Cost Considerations

"Until quite recently most computer applications in education have proceeded with typewriter-like terminals," he said, due primarily to cost considerations.

"Recently," he added, however, "graphic terminals have become practical, with costs at a level of the better typewriter terminals. Costs are continuing to decrease because of competition among several graphic technologies."

Because of this, most, if not all future educational projects will primarily use graphics terminals, he said.

User-Oriented Languages

The need now, he indicated, was in the development of user-oriented languages and programs that will allow students to use the new facilities successfully. The new languages must exploit the capabilities of the terminals and at the same time be easy enough for non-computer experts to use.

"Flexible user-oriented facilities are needed to both allow students to write their own programs and to allow teachers to write student-computer dialogs," he said.

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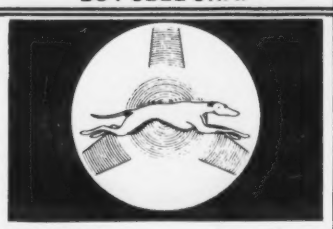

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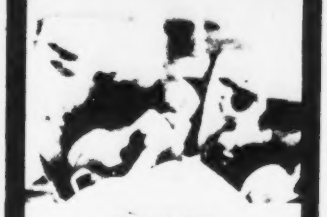

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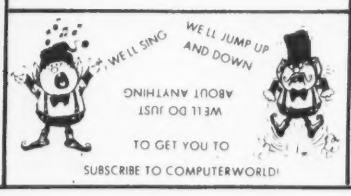

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Microdata Hails Profit

SANTA ANA, Calif. – With revenues rising 269% above those of 1971, Microdata Corp. recorded its first profitable year in its history. Earnings totaled $676,643, or 51 cents a share, on revenues of $6.2 million.

In 1971, the firm lost $1.5 million, or $1.43 a share, on revenues of $2.3 million. Current earnings include a $318,000 special credit from tax-loss carryforward. The 1971 earnings figure includes a $119,853 special charge resulting from goodwill write off.

The minimaker finished the year in strong style, with revenues for the fourth quarter rising 229% to almost $2 million from $851,392 in 1971. Earnings totaled $243,722, or 18 cents a share, compared with a loss of $1 million, or 80 cents.

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Results on Upswing at Keydata, Rapidata

Keydata Corp. reported record revenues and earnings for the year ended July 31, and Rapidata, another service firm, finished its second quarter with a 52% rise in earnings.

At Keydata, earnings reached $348,198, or 14 cents a share, compared with $52,306, or 2 cents a share in 1971. Revenues for the period totaled $7.5 million, up from $6.1 million a year ago.

The company "achieved a positive cash flow from operations for the first time since it began marketing business time-sharing services in 1965," President John T. Gilmore Jr. observed.

"We turned the corner in the past year, attaining cash flow of approximately $350,000, an improvement of more than $800,000 from the previous year."

The news was also cheerful at Rapidata, with second-quarter earnings up 52% to $264,376 from $173,682 in the year-ago period, on revenues of $2 million compared with $1.4 million.

Six month earnings totaled $452,735, or 24 cents a share, compared with $317,056, or 19 cents a share in the 1971 half year. Revenues rose to $3.7 million from $2.6 million.

REI Reports Revenue Rise in 9 Months

DALLAS – Recognition Equipment Inc.'s nine-month report for the period ending July 31 shows declining earnings on rising revenues. However, subsequent adjustments for the past year resulted in earnings of $487,000, or .095 cents a share, for the entire year.

Earnings in this year's period totaled $994,000, or 20 cents a share, compared with $1.5 million, or 28 cents a share in 1971. Revenues rose to $29.1 million from $27.8 million.

Shipments in the nine months rose to $14 million, up from $13.6 million last year, and fourth-quarter shipments are expected to be slightly less than for last year's fourth quarter, the company said. As of July 31, the backlog was $8.7 million, excluding postal contracts.

Pertec Sees Earnings, Revenues Rise for Year

LOS ANGELES – Peripherals maker Pertec Corp. completed the year ended June 30 with revenues rising to $22.9 million from $21.5 million in 1971. Earnings rose $17,000, to almost $2 million, or 64 cents a share.

Fourth-quarter revenues rose, but earnings declined. Revenues totaled $6.1 million compared with $5.9 million in the same period last year, while earnings were off to $420,000 from $569,000.

Nickels & Dimes

L.M. Ericsson of Sweden has guaranteed a portion of **MCI Communications Corp.**'s indebtedness under a $64 million bank credit agreement in amounts equal to 60% of MCI purchases from Ericsson Centrum, Inc. Purchases of multiplex and other equipment are expected to exceed $6 million during the next 30 months.

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Brooks International has changed its focus within the last year from that of a computer lessor to a heavy equipment manufacturer, but leasing revenue, although declining in the year to $654,000 from $737,000 last year, "continues to provide a desirable positive cash flow," according to President T.M. Brooks.

Brooks International intends to limit its DP investment "to its present level, except in the case of an unusually high-profit potential opportunity," he added.

$$$

Computer Services Corp., a Michigan-based service bureau, attributes a 30% increase in sales in fiscal '72 over the previous year to diversification of customer services accounts into data entry, data processing and software services.

$$$

Following a year when earnings increased more than five times on a 29% rise in revenues, **Central Data Systems** of Cleveland is planning "active sales programs" to expand its customer base throughout its various operations. This was the first year operations "outside of Cleveland contributed significantly on both revenues and profits," President Marvin L. Lader said.

$$$

Measurex has obtained a $20 million revolving credit from two banks to finance its leasing program of digital process control systems. The banks are Manufacturers Hanover Trust Co. and Bank of America.

$$$

Data Dimension's Systems Services Division put its first systems management customer on line in January, and the division's six-month revenues have increased 40% over last year.

$$$

Magnetic Head President Alan S. Hayes is looking for a turnaround. In the first nine months, the firm earned $2,679 and backlog rose from $300,000 at the beginning of the year to $1.2 million as of September.

$$$

Dividend Time – **Western Union International** will pay its first dividend, 10 cents a share, on Dec. 12 to stockholders of record Nov. 28. The payout results from "steady improvement" this year. The firm has no plans for regular payouts.

Acquisitions

Interactive Sciences Corp., a time-sharing firm, has acquired **Computeria Inc.**, an applications program distributor. Computeria will operate as a division of Interactive Sciences.

Data Products Maintenance Inc., broker in IBM equipment, has acquired **Mack Services Inc.**

Commerce Group Corp. has acquired the leased computer equipment and related assets of **NCC Industries Inc.** for about $2 million in cash and stock.

Midtex Inc., keyboard systems manufacturer, has agreed to acquire a 33% interest in **Comstar Corp.**, a production control computer firm.

Orrox Corp. has agreed in principle to acquire **Barger Corp.**, manufacturer of magnetic tape and head equipment. The merger is subject to stockholder approval.

Victor Comptometer Corp. has agreed to acquire **Nissen Corp.**, gymnastic apparatus manufacturer, for an exchange of stock.

Nicolet Instrument Corp. has purchased a majority interest in **Federal Scientific Corp.** from Elgin National Industries.

Earnings Reports

DIGITAL EQUIPMENT
Year Ended July 1

	1972	1971
Shr Ernd	$1.49	$1.06
Revenue	187,553,000	146,849,000
Earnings	15,300,000	10,600,000
3 Mo Shr	.49	.28
Revenue	56,468,000	42,519,000
Earnings	5,060,000	2,852,000

ELECTRONIC COMPUTER PROGRAMMING INSTITUTE
Three Months Ended June 30

	1972	1971
Shr Ernd	$.01	.....
Revenue	1,056,918	$684,754
Spec Chg	.....	a21,906
Earnings	7,114	(46,836)
6 Mo Rev	2,045,167	1,426,645
Spec Chg	.....	a21,906
Earnings	561	(27,191)

a-Loss on sale of a 90%-owned subsidiary.

SEISMIC COMPUTING
Three Months Ended June 30

	1972	1971
Shr Ernd	$.20	$.27
Revenue	7,317,000	6,982,000
aSpec Cred	5,000	15,000
Earnings	254,000	321,000
9 Mo Shr	.46	.43
Revenue	17,809,000	16,586,000
aSpec Cred	24,000	35,000
Earnings	575,000	503,000

a-Gain on repurchase of subordinated debentures.

COMRESS
Six Months Ended June 30

	1972	a1971
Shr Ernd	$.04	$.01
Revenue	3,292,000	2,483,200
Spec Cred	.....	b173,900
Earnings	249,600	83,700

a-Restated. b-Gain from sale of securities.

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The package, priced at $8,000, includes all program documentation and installation assistance. Performance is guaranteed, and enhancements will be provided for one year from date of purchase.

Contact Investment Management Group Support Services, North Carolina National Bank, P.O. Box 120, Charlotte, N.C. 28201, (704) 374-5211 or 374-5034.

NCNB North Carolina National Bank

TRADE*QUOTES®

Computerworld Stock Trading Summary

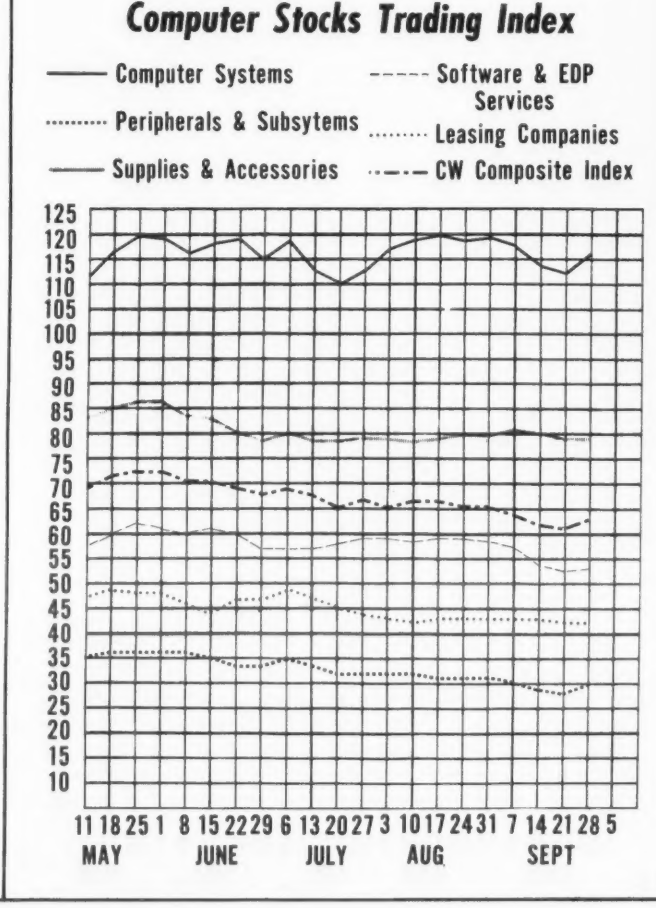
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, SEPTEMBER 28, 1972

EXCH		1972 RANGE (1)	CLOSE SEP 28 1972	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 3	2 7/8	+ 1/8	+4.5
A	APPLIED DATA RES.	4- 7	4 5/8	+ 1/4	+5.7
O	APPLIED LOGIC	1- 4	2 5/8	0	0.0
N	AUTOMATIC DATA PROC	72- 99	92 7/8	+3 1/4	+3.6
O	BRANDON APPLIED SYST	1- 2	1 1/8	0	0.0
O	COMPUTER DIMENSIONS	6- 14	6 3/4	- 1/2	-6.8
O	COMPUTER DYNAMICS	1- 4	7/8	0	0.0
O	COMPUTER NETWORK	4- 7	5	0	0.0
N	COMPUTER SCIENCES	5- 10	5 1/2	- 1/8	-2.2
O	COMPUTER TASK GROUP	1- 2	1	0	0.0
O	COMPUTER TECHNOLOGY	4- 8	4	0	0.0
O	COMPUTER USAGE	7- 14	9	+ 1/2	+5.8
O	COMP AUTOMOT REPORTS	5- 9	5 1/8	+ 3/8	+7.8
N	COMPUTING & SOFTWARE	14- 28	15 1/4	+1 3/8	+9.9
O	COMRESS	1- 3	1 1/4	0	0.0
O	COMSHARE	5- 10	6 1/2	+ 1/4	+4.0
O	DATATAB	5- 9	4 1/2	- 1/8	-2.7
O	EDP RESOURCES	3- 8	3	+ 1/4	+9.0
A	ELECT COMP PROG	2- 5	1 1/2	- 3/8	-20.0
N	ELECTRONIC DATA SYS.	43- 65	55	+2 1/2	+4.7
O	INFORMATICS	6- 11	5 3/4	0	0.0
O	I.O.A. DATA CORP	1- 3	1 1/4	0	0.0
O	KEANE ASSOCIATES	4- 7	4 1/4	- 1/2	-10.5
O	KEYDATA CORP	7- 13	12	0	0.0
O	LOGICON	4- 9	6 3/8	+ 1/4	+4.0
A	MANAGEMENT DATA	5- 10	5 1/8	+ 1/8	+2.5
O	NATIONAL CSS INC	8- 28	25 1/2	+1 1/4	+5.1
O	NATIONAL INFO SRVCS	2- 5	1 3/4	- 1/8	-6.6
P	ON LINE SYSTEMS INC	8- 20	20	+1 1/2	+8.1
N	PLANNING RESEARCH	8- 17	7 3/4	0	0.0
O	PROGRAMMING METHODS	20- 24	21 1/2	0	0.0
O	PROGRAMMING & SYS	1- 2	1 1/4	+ 1/4	+25.0
O	RAPIDATA INC	5- 25	22	-1	-4.3
O	SCIENTIFIC COMPUTERS	2- 4	2	0	0.0
O	SIMPLICITY COMPUTER	1- 5	4 1/4	+ 1/4	+6.2
O	TBS COMPUTER CENTERS	4- 6	4 1/2	0	0.0
O	TCC INC	1- 3	1 1/8	- 1/8	-10.0
O	TYMSHARE INC	7- 11	8 3/4	+1	+12.9
O	UNITED DATA CENTER	5- 8	6	0	0.0
N	UNIVERSITY COMPUTING	13- 26	14 1/8	+1 1/2	+11.8
A	URS SYSTEMS	6- 10	8 3/8	+ 1/8	+1.5
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	34- 49	40 5/8	+ 1/8	+0.3
O	ADVANCED MEMORY SYS	12- 23	14 3/8	+2 3/8	+19.7
N	AMPEX CORP	5- 15	5 5/8	+ 1/4	+4.6
O	ANDERSON JACOBSON	5- 8	4 1/4	+ 1/4	+6.2
O	ATLANTIC TECHNOLOGY	1- 11	7/8	+ 1/4	+40.0
O	BEEHIVE MEDICAL ELEC	1- 5	3 7/8	+ 1/8	+3.3
A	BOLT,BERANEK & NEW	5- 21	18 7/8	+1 3/8	+7.8
N	BUNKER-RAMO	9- 14	10 3/4	+ 5/8	+6.1
A	CALCOMP	11- 25	11 3/8	+ 3/8	+3.4
O	CAMBRIDGE MEMORIES	9- 15	11	+ 1/2	+4.7
O	CENTRONICS DATA COMP	11- 53	39	-4 1/2	-10.3
O	COGNITRONICS	2- 5	2 3/4	+ 1/8	+4.7
O	COMPUTER COMMUN.	1- 7	2 1/8	0	0.0
A	COMPUTER EQUIPMENT	3- 4	2 5/8	0	0.0
O	COMPUTER MACHINERY	7- 13	8 3/4	- 1/8	-1.4
A	COMPUTEST	4- 9	3 7/8	- 3/8	-8.8
A	DATA PRODUCTS CORP	3- 7	3 3/8	- 1/4	-6.8
O	DATA RECOGNITION	1- 5	1 1/4	0	0.0
O	DATA TECHNOLOGY	2- 5	2 5/8	0	0.0
O	DI/AN CONTROLS	0- 8	4 5/8	- 1/8	-2.6
N	ELECTRONIC M & M	4- 8	3 3/4	+ 1/8	+3.4
O	FABRI-TEK	2- 5	2 7/8	+ 1/8	+4.5
O	GENERAL COMPUTER SYS	7- 16	9	- 1/2	-5.2
N	GENERAL ELECTRIC	59- 70	66 3/8	+1 3/8	+2.1
N	HAZELTINE CORP	8- 13	8 1/4	+ 1/4	+3.1
O	INFOREX INC	20- 36	21	+1	+5.0
O	INFORMATION DISPLAYS	1- 5	2 1/8	- 3/8	-15.0
A	LUNDY ELECTRONICS	9- 14	10 3/8	+ 1/2	+5.0
O	MANAGEMENT ASSIST	1- 2	1 1/4	+ 7/8	+233.3
N	MEMOREX	16- 38	19 3/8	+1	+5.4
A	MILGO ELECTRONICS	17- 44	25 1/2	+ 7/8	+3.5
N	MOHAWK DATA SCI	14- 27	16 1/4	+ 3/4	+4.8
O	OPTICAL SCANNING	7- 16	8 3/4	- 3/4	-7.8
O	PERTEC CORP	8- 17	9 1/2	+ 1/2	+5.5
O	PHOTON	6- 15	7 1/8	- 5/8	-8.0
A	POTTER INSTRUMENT	8- 21	8 3/8	+ 1/8	+1.5
O	PRECISION INST.	4- 13	4 3/4	- 1/4	-5.0
O	RECOGNITION EQUIP	7- 15	6 1/2	- 3/4	-10.3
N	SANDERS ASSOCIATES	13- 21	14 5/8	+ 3/8	+2.6
O	SCAN DATA	7- 13	7 1/2	0	0.0
O	STORAGE TECHNOLOGY	17- 39	27 5/8	-1	-3.4
O	SYCOR INC	7- 11	10 3/4	+1	+10.2
O	TALLY CORP.	8- 15	12	+ 1/2	+4.3
N	TEKTRONIX INC	34- 64	53 3/4	+2 3/4	+5.3
N	TELEX	6- 15	7 1/4	- 1/4	-3.3
O	WILTEK INC	10- 26	16	-1 3/4	-9.8
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	6- 9	7	0	0.0
A	BARRY WRIGHT	9- 14	11 7/8	0	0.0
A	DATA DOCUMENTS	17- 26	19 7/8	+ 3/8	+1.9
O	DUPLEX PRODUCTS INC	8- 16	8	0	0.0
N	ENNIS BUS. FORMS	7- 10	6 1/2	- 3/8	-5.4
O	GRAHAM MAGNETICS	15- 27	17	- 5/8	-3.5
O	GRAPHIC CONTROLS	12- 15	13	- 3/4	-5.4
N	3M COMPANY	76- 85	79 3/4	+2 1/2	+3.2
O	MOORE CORP LTD	42- 56	53 1/8	+ 7/8	+1.6
N	NASHUA CORP	48- 62	57 1/4	+ 7/8	+1.5
O	REYNOLDS & REYNOLD	37- 77	44 1/4	+1 5/8	+3.8
O	STANDARD REGISTER	14- 20	16 1/2	0	0.0
O	TAB PRODUCTS CO	14- 21	21 1/4	+ 3/4	+3.6
N	UARCO	22- 28	21 1/2	- 3/8	-1.7
A	WABASH MAGNETICS	7- 11	7 1/8	- 1/8	-1.7
N	WALLACE BUS FORMS	21- 26	21 1/8	-1	-4.5
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	147-226	223	+12 3/4	+6.0
N	COLLINS RADIO	14- 20	15 3/4	+ 5/8	+4.1
N	CONTROL DATA CORP	43- 78	74 3/8	+4 1/8	+5.8
O	DATA GENERAL CORP	56-115	112 1/2	+8	+7.6
O	DIGITAL COMP CONTROL	9- 25	10 5/8	-1 1/8	-9.5
N	DIGITAL EQUIPMENT	72-101	95 1/2	+9 7/8	+11.5
N	ELECTRONIC ASSOC.	6- 13	8 5/8	- 3/8	-4.1
A	ELECTRONIC ENGINEER.	6- 14	7 1/8	+ 5/8	+9.6
N	FOXBORO	26- 41	27 3/4	+ 3/8	+1.3
O	GENERAL AUTOMATION	13- 38	35 1/4	+2 3/4	+8.4
O	GRI COMPUTER CORP	3- 5	3 3/4	0	0.0
N	HEWLETT-PACKARD CO	46- 77	72 7/8	+6 3/8	+9.5
N	HONEYWELL INC	130-170	134 5/8	-7 1/8	-5.0
N	IBM	333-426	404 1/4	+4 3/4	+1.1
O	INTERDATA INC	8- 16	12 3/4	+1 3/4	+15.9
O	MICRODATA CORP	5- 10	8	0	0.0
N	NCR	29- 38	37 1/2	+2	+5.6
N	RAYTHEON CO	29- 47	31 3/8	+2 1/8	+7.2
N	SPERRY RAND	30- 48	44 7/8	+1 1/8	+2.5
A	SYSTEMS ENG. LABS	10- 16	10	+ 1/4	+2.5
N	VARIAN ASSOCIATES	14- 22	21	- 3/8	-1.7
N	VICTOR COMPTOMETER	15- 24	17 1/4	- 7/8	-4.8
N	WANG LABS.	24- 61	24 1/8	-7 3/4	-24.3
N	XEROX CORP	121-172	154 3/8	+3 1/2	+2.3
	LEASING COMPANIES				
A	BOOTHE COMPUTER	4- 18	4 1/8	- 3/8	-8.3
O	BRESNAHAN COMP.	2- 3	2	0	0.0
O	COMDISCO INC	3- 18	15	+1 1/2	+11.1
O	COMMERCE GROUP CORP	5- 11	6 1/2	- 1/8	-1.8
O	COMPUTER EXCHANGE	1- 3	1	0	0.0
A	COMPUTER INVSTRS GRP	8- 14	8	- 3/8	-4.4
N	DPF INC	5- 13	5 3/4	+ 1/2	+9.5
M	DATRONIC RENTAL	2- 4	2	+ 1/8	+6.6
A	DCL INC	5- 10	4 5/8	0	0.0
A	DEARBORN-STORM	16- 26	19 3/8	+1 5/8	+9.1
A	DPA, INC.	5- 8	6 3/8	- 1/4	-3.7
A	GRANITE MGT	5- 11	6 1/4	- 1/8	-1.9
A	GREYHOUND COMPUTER	6- 11	6 3/8	+ 1/8	+2.0
A	ITEL	7- 12	7 3/4	- 1/8	-1.5
N	LEASCO CORP	17- 24	19	- 1/8	-0.6
O	LEASPAC CORP	7- 15	8	+ 3/4	+10.3
O	LECTRO MGT INC	1- 4	2 5/8	0	0.0
A	ROCKWOOD COMPUTER	2- 7	2 3/8	- 1/8	-5.0
O	SYSTEMS CAPITAL	3- 20	13 7/8	0	0.0
N	U.S. LEASING	19- 33	29	-1 1/2	-4.9

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



Earnings Reports

MEMOREX
Six Months Ended June 30

	1972	1971
Shr Ernd	$.09	.....
Revenue	69,541,000	$51,590,000
Earnings	334,000	(3,811,000)

TALLY
Three Months Ended July 2

	1972	1971
Revenue	$3,410,000	$2,520,000
Loss	208,000	284,000
6 Mo Rev	6,201,000	5,058,000
Loss	430,000	451,000

WESTERN UNION INTERNATIONAL
Three Months Ended June 30

	1972	1971
Shr Ernd	$.42	$.28
Revenue	16,362,000	13,760,000
Spec Cred	.....	198,000
Earnings	1,287,000	833,000
6 Mo Shr	.79	.73
Revenue	31,618,000	28,121,000
Spec Cred	.....	198,000
Earnings	2,422,000	2,131,000

STANDARD REGISTER
Three Months Ended July 2

	1972	1971
Shr Ernd	$.44	b$.18
Revenue	27,370,903	27,055,486
Earnings	937,685	b397,435
6 Mo Shr	a.70	b.64
Revenue	53,597,979	55,612,803
Earnings	a1,502,120	b1,386,978

a-Includes restatement of first quarter to reduce certain estimated expenses. b-Restated to reflect certain year-end audit adjustments to make current year and prior year interim periods comparable.

COMPUTER EQUIPMENT
Three Months Ended July 1

	1972	a1971
Shr Ernd	$.07	$.07
bRevenue	5,613,000	5,137,000
Loss Disc Op	.....	41,000
cSpec Cred	70,000	118,000
Earnings	196,000	175,000
6 Mo Shr	.15	.13
bRevenue	10,642,000	10,105,000
Loss Disc Op	.....	81,000
cSpec Cred	117,000	178,000
Earnings	385,000	320,000

a-Restated. b-From continuing operations. c-Primarily from tax credits and gain from purchase of debentures.

COMPUTER DESIGN
Three Months Ended June 30

	1972	1971
Shr Ernd	.....	$.24
Revenue	$2,452,339	3,814,862
Earnings	(366,943)	303,415
6 Mo Shr	.....	.41
Revenue	6,766,627	6,852,646
Tax Cred	.....	79,000
Earnings	(241,995)	523,241

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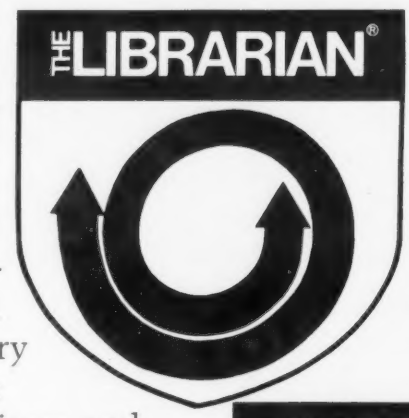

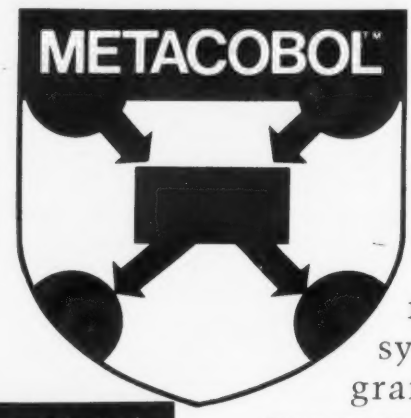

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Name _____ Title _____
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Computer Configuration _____

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